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THIS WEEK'S NEWS

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THE FACULTY OF ARCHITECTURE of the British School at Rome has announced the names of the candidates admitted to the final stage of the competition for the Rome Scholarship in Architecture, 1949. 328

THE INTENSE COMPETITION between official architectural departments and private architects to attract and retain architectural staff has led a number of private firms to attempt some form of rationalisation with regard to employees' salary scales. Two such firms—Arcon, chartered architects, and Sir John Burnet, Tait and Partners—have taken the step of publishing salary scales which they have laid down. Arcon have graded their assistants according to their standing in relation to the R.I.B.A. examinations and Sir John Burnet, Tait and Partners classify their assistants under the five headings of improvers, junior assistants, assistants, senior assistants and assistant architects. 331

A PLANNING REPORT on the Thames riverside from Chiswick to Staines, prepared by Messrs. W. R. Davidge and Partners, consultants to the West Middlesex Joint Planning Committee, is reviewed by Mr. Martin S. Briggs, F.R.I.B.A. 332

A COTTAGE constructed in Dorset Stone, designed by Mr. E. Wamsley Lewis, A.R.I.B.A., and completed in January, 1947, at a cost of £1,170, is illustrated on page 342

THE COURT OF COMMON COUNCIL has been informed that the City of London has been allotted one-third of the amount of steel to be allowed for the reconstruction of the bombed cities of the country. 343

STRUCTURAL TECHNIQUE in the design of industrial buildings, heating and ventilating and natural and artificial lighting were among the subjects discussed at "The Architect in Industry" conference organised by the Royal Institute of British Architects. A summarised report of the principal papers read at the conference is given. 344

MR. NORMAN LONGLEY, President, N.F.B.T.E., and Sir Archibald Harris, Timber Controller, 1939-47, were among the principal speakers at a conference recently held in London as part of a campaign against the use of substitutes for timber in building and other industries. 350

THE Minister of Labour and National Service has suggested various precautions to promote safety in the use of portable electric tools on building work. 351

SPEAKING at a meeting of the Midland Federation of Building Trades Employers shortly before leaving for Rome for the second meeting of the Building and Civil Engineering Committee of the International Labour Office, Mr. Norman Longley, President, N.F.B.T.E., said the time had come when the citizens of this country, of whatever social class or income group, must have restored to them the right to decide whether to buy a new house or live in one provided by the local authority with heavy subsidies from the rates and taxes. 351

BUILDING RESEARCH

THE Department of Scientific and Industrial Research has just published the annual report for 1946* of the Building Research Board—dated August, 1947, in the Chairman's covering memorandum to the Privy Council, and 1949 on the title page. Whether their Lordships have left it in their "IN" tray all this time, or whether the D.S.I.R. is unable to obtain for itself the priority in paper and printing which all Government departments are popularly supposed to possess, is unknown to us; but, as a result of this excessive delay, our comments here must treat it as an historical document and not as the latest news; we must assume no privy knowledge of happenings at Garston or Barnet or Abbots Langley since the last day of 1946. The first historical event is, or rather was, the departure of the Director, Mr. I. G. Evans, from the B.R.S. to the headquarters of the Department and the appointment of Dr. F. M. Lea in his place. Mr. Evans guided the work of the Station through the difficult days of the war, and was largely responsible for initiating the programme of post-war activities, especially in regard to experimental house-building.

A discreet hint is given that more cordial support from the building industry would be welcome, and that apathy exists elsewhere is shown by the statement that, out of some 600 quarry-owners circularised about available building-stone, only 140 made any reply and only 54 supplied the samples of stone for which they were requested. Comment is needless. On the other hand, the number of visitors to the Station was double that of the previous year, as might be expected considering that war was still being waged in 1945. As for inquiries, these rose by about 40 per cent. to 2,852, mainly from architects and consultants, builders, "official quarters," merchants and manufacturers. The staff of the Station at the end of the year numbered 342, of whom 90 were in the "industrial" category. From such a wealth of talent and experience one would anticipate substantial results, and this report, in spite of official reticence, reveals that they were duly obtained. Much of the work of the Station does not lend itself to lively description, the greater part of it being necessary routine of observation, experiment and recording. A great deal of time is inevitably absorbed, too, in work for committees and in the preparation of reports and publications. Nevertheless, many things did happen in 1946 that are of interest to most people connected with building.

For example, efforts were made in several directions to cope with shortages of building materials. In spite of the quarry-owners' lethargy, the possibility of substituting stone for brick in "stone districts" was revived; the perennial hunt for suitable furnace clinker as an aggregate was resumed; the immense heaps of rubble from bombed buildings were scientifically examined as an alternative form of aggregate and some conclusions reached as to its suitability; and experiments were made without much success in diluting plaster owing to shortage of gypsum, and with substitutes for scarce linseed oil in paint. The elaborate system of investigating domestic heating systems, mainly with a view to counteracting loss of heat and consequently promoting fuel economy, was continued; while another venture, hardly a matter of building, involved tests of reinforced concrete railway-sleepers—to save timber. The so-called "rat-trap bond" was tested to see whether

* *Building Research*, 1946. Department of Scientific and Industrial Research, pp. iv., 52, illustrated. H.M.S.O., 1s. 6d. net.

the quantity of bricks could be lessened by its use. Many types of walling-blocks were employed in the important group of semi-detached houses that were erected on a site at Abbots Langley, and there also the ingenious experiments in domestic heating were continued. It was proposed to build some experimental flats, likewise at Abbots Langley.

Other work on materials dealt with the properties of bricks, the durability of flooring finishes, building boards, the painting of brickwork and of cemented and concrete surfaces, including asbestos-cement cladding, the reliability of building boards (of which "many are still in the experimental stage"), the resistance to weather of concrete kerbs, of external rendered finishes and of plastic materials. The report describes a most ingenious but very simple appliance devised (apparently by the staff of the B.R.S.) for removing, without the use of solvents, "the large areas of the fabric-bitumen combination applied to roof glazing during the war for protective purposes." Other machines were tried and compared for testing various flooring materials "with special reference to the measurement of wear, slipperiness, and indentation under load"; and elsewhere in the report reference is made to "instrument development," which is always an important task of applied science in research. It demands a combination of high scientific attainment and of practical ingenuity, two qualities rarely found in one person, and it is thus natural that a successful venture accomplished in this field is welcomed and appreciated by all scientific workers. On the other hand, the appliances and methods used by laboratory workers, however important and valuable to them, have little interest for busy people in the building industry and only tend to complicate pamphlets issued for their guidance. Occasionally leaflets published by the B.R.S. for such a public have contained too much information about laboratory methods whereas only the results and their lessons are needed.

In other sections, useful progress is reported in "method study" on wall-building, piled foundations for houses, stability and house-framing, reinforced concrete, buttressed concrete, filler joist floors, subsoil clay and settlements, sound insulation and fire-resistance. The remarkable "Shunt" system of combined brick flues, as introduced in Belgium, is described and illustrated with cautious reservations as to its practicability for use in this country. Among official publications of 1946 were six more pamphlets in the useful series *Repair of Damaged Buildings*, a result of the war. Altogether this is an interesting if belated report.

NOTES AND NEWS

The Thames Riverside.

ELSEWHERE in this issue we review the recently published report on the planning of "The Thames Riverside from Chiswick to Staines." Because that part of the river provides a popular recreation-ground for London's millions, it is more familiar than any other section of the Thames outside the metropolis; and because it is so accessible it has suffered more than any other from the indiscriminate peppering of the banks with every form of crazy villa, shack and caravan, during the present century. Only at Hurley, many miles upstream, does any reach of the river display such untidiness and vulgarity as now disfigures several pleasant stretches between Sunbury and Staines. Not only are most of these flimsy structures lacking in proper sanitation, services and means of access, but on occasion they are completely isolated by floods, as happened in March, 1947. For once, we cannot blame the Victorians for these atrocities, and even if the present acute housing shortage may be urged as accountable for some of these desperate expedients, many or most of the worst examples date from inter-war period. In any case, however, the town planner with a view to creating the best conditions practicable as soon as circumstances permit is bound to look ahead with some regard for decency and beauty, for beautiful scenery is involved as well as architectural considerations.

Clearance of Low-lying Area.

IT therefore follows that this new report advocates the ultimate clearance of the low-lying areas where and when possible, enabling almost all the riverside meadows on the Middlesex bank above Sunbury to become public open spaces, interrupted only by the "villages" of Shepperton and Laleham. Below Sunbury, continuous reservation or sterilisation of this kind is obviously impracticable, but several miles of the river frontage already belong to the public (e.g. Hampton Court and Marble Hill Parks) and much more should and will be acquired, including Syon Park at Isleworth. The industrial eyesore of Brentford seems to be ineradicable, and some of the gravel pits near Ashford furnish a problem which the authors of the report do not solve. Among English rivers, the Thames has a character and charm of its own. The greater part of its length above Staines is, fortunately, still comparatively inviolate; but this report proves, what many people have long realised, that the Middlesex bank need never have been so lamentably spoiled; and also, perhaps even more important, that much of the damage is not only sporadic but skin deep, so that it is curable in the end by wise and imaginative planning. Aesthetic reasons apart, there is every justification for the limited measure of "Architectural Control" that is proposed for Chiswick Mall, Strand-on-the-Green, Old Isleworth, Twickenham Riverside and Sion Row, and a few minor places; and the historical associations of this part of the Thames—from Wolsey and many royal figures at Hampton Court to Pope and Garrick and Horace Walpole at Twickenham—are almost comparable with the renown of Windsor and Oxford.

Private Architects and Salary Grades.

THE shortage of good architectural assistants has led to a competition for their services both by architects in private practice and by official departments. This, while to the short-term advantage of the assistants themselves, is seriously interfering wtih the efficient carrying out of building projects. Typical of the difficulties which are met is the experience of a municipal architect who recently told us that the interchange of assistants in his department is such that a high proportion of his working time is taken up in writing testimonials for departing members of his staff and in interviewing new material. The average length of stay of his junior staff is less than a year, and this in spite of fair salary grades and considerate treatment.

Private architects, though seemingly not embarrassed to a like extent (the reasons for this would be interesting to know), find much the same difficulty in recruiting and retaining staff, largely because they often do not, or cannot, pay equivalent rates to those offered by local authorities, though here it will be remembered that even a wealthy authority such as the London County Council has recently found it necessary to protest at the rates being paid to town planning assistants by other authorities, which have had the effect of causing a continual circulation of assistants who are chasing higher salary rates.

At a time like the present, when cost of living is continually advancing, one cannot blame assistants in private offices for seeking to improve their financial situation, yet many would prefer a stable position could they look forward to some security of salary and prospects. It is of considerable interest, therefore, that two firms of leading London architects have this week published salary scales for their assistants, and these are referred to in an article elsewhere in this issue. No doubt other firms have also laid down scales and conditions of employment, and these will vary whether in London or the provinces, where the cost of living is lower. The principle is an excellent one, and deserves careful consideration by all firms in their assistants' and their own interests.

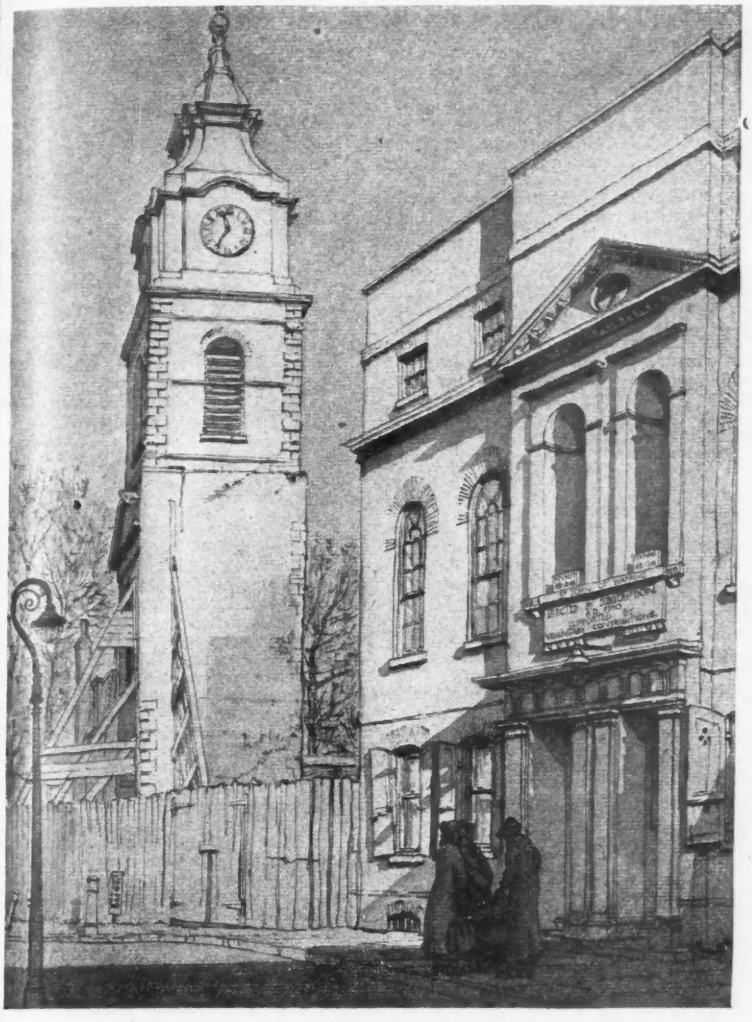
The Rome Scholarship, 1949.

THE Faculty of Architecture of the British School at Rome announce that the following candidates have been admitted to the final stage of the competition for the Rome Scholarship in Architecture, 1949:—G. P. Dawson, (Manchester U. Sch. of Arch.); W. A. Gibbon, B.A., (Manchester U. Sch. of Arch.); H. N. Mason, B.Arch., (Liverpool U. Sch. of Arch.); I. S. Melville, (Liverpool U. Sch. of Arch.); G. H. Holroyd, (Sheffield U. Dep. of Arch.); and H. A. Wheeler, A.R.I.B.A., (Glasgow Sch. of Arch.).

The Rome Scholarship is at present of the value of £375 a year, and is ordinarily tenable for two years at the British School at Rome. It is provided by a grant from the Royal Institute of British Architects.

School of Architecture.

THE Royal Academy School of Architecture, which is now directed by Mr. A. E. Richardson, R.A., Professor of Architecture at the Royal Academy, with the assistance of Mr. Marshall Sisson, has been open for post-graduate students during the past two years. Two prizes for the session 1947-48 were awarded recently, one to Mr. W. F. Stewart, Glasgow School of Architecture, and the other (the gift of Lord Fairhaven) to Mr. G. K. Porter, the Welsh School



ST. JOHN OF WAPPING. **From a pen-and-wash drawing by G. Foster Fletcher.**

of Architecture, Cardiff, and Liverpool School of Architecture. Inquiries and applications for admission to the course should be addressed to the secretary, Royal Academy of Arts, Piccadilly, London, W.1.

R.I.B.A. Diploma in Town Planning.

MR. CLIFFORD E. PLEWS, A.R.I.B.A., having passed the qualifying examination, has been awarded the R.I.B.A. Diploma in Town Planning.

Ecclesiological Exhibition.

A ONE-DAY exhibition of drawings, paintings, photographs, etc., arranged by the Ecclesiological Society will be held at the Archbishop Davidson Institute, Lambeth-road, S.E.1, on Wednesday, March 23. The exhibition will be formally opened by the Very Rev. W. R. Matthews, Dean of St. Paul's, and will include water colours by Dennis Flanders and Gerald Cobb, as well as contemporary lithographs of churches designed by Healey and Mallinson, architects, a century ago. A number of books, prints and other objects of ecclesiological interest will also be on view. The exhibition will remain open from 11 a.m. to 6.30 p.m.

Two Appointments.

MR. WILLIAM WILSON, A.R.I.B.A., A.M.T.P.I., regional architect with the Scottish Special Housing Association, Ltd., has been appointed County Architect and Town Planning Officer, Caithness.

MR. G. RAY, A.R.I.B.A., has been appointed Deputy County Architect, Pembrokeshire.

Deputy County Architect Appointed.

MR. THOMAS J. DAVIES, F.R.I.B.A., who is at present Chief Assistant Architect to the Shropshire County Council, has been appointed deputy county architect to the Caernarvonshire County Council, and will commence his new duties early in April.

A Portrait of Thomas Cubitt.

AN interesting ceremony took place at the Council Meeting of the London Master Builders' Association yesterday afternoon, when Lord Ashcombe, chairman of Holland & Hannen and Cubitts, Ltd., and great grandson of Thomas Cubitt, founder of the firm, handed over a portrait of his distinguished ancestor to Mr. Nigel Hannen, grandson of the first President and fourth member of the firm to hold the office.

Professional Announcements.

THE new address of Mr. ERVIN KATONA, A.R.I.B.A., chartered architect, is 23, Old Burlington-street, W.1.

MESSRS. W. J. F. TILLYARD, chartered quantity surveyors, incorporating Messrs. T. Sumner Smith and Partners, announce that they have moved from their offices at Clifton Lodge, Victoria Park, Manchester 14, to 2, Brazennose-street, Deansgate, Manchester 2 (tel: Blackfriars 9074).

COMING EVENTS

Monday, March 21.

TIMBER DEVELOPMENT ASSOCIATION.—"New Woods for Old—Some Alternatives to Traditional Timber," by Mr. B. A. Jay, M.A., F.L.S. Polytechnic, Regent-street, W.1. 7.15 p.m.

Tuesday, March 22.

THE HOUSING CENTRE.—"The Hartlepools: A Survey and Plan," by Mr. Max Lock, A.R.I.B.A., A.M.T.P.I. 13, Suffolk-street, S.W.1. 1.15 p.m.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Architectural Science Board Lecture—"The Protection of Metals against Corrosion," by Dr. T. P. Hoar, M.A., B.Sc. 66, Portland-place, W.1. 6 p.m.

CENTRAL OFFICE OF INFORMATION.—"Recent House Heating Experiments at Abbots Langley," by Dr. J. C. Weston, Ph.D. Digbeth Institute, Digbeth, Birmingham. 6.15 p.m.

TOWN AND COUNTRY PLANNING ASSOCIATION.—"Planning the Hartlepools," by Mr. Max Lock, A.R.I.B.A. Planning Centre, 28, King-street, W.C.2. 6.15 p.m.

THE INSTITUTE OF WELDING AND THE BRITISH WELDING RESEARCH ASSOCIATION.—Conference on welding as an aid to saving steel and man-power. Ashorne-hill, near Leamington Spa, Warwickshire. Opening address at 8.15 p.m. (Conference continues until March 25).

Wednesday, March 23.

THE ARCHITECTURAL ASSOCIATION.—"The Architect and Planning," by Mr. S. Rowland Pierce, F.R.I.B.A. 34, Bedford-square, W.C.1. 8 p.m.

THE ROYAL INSTITUTION OF CHARTERED SURVEYORS.—Quantity Surveyors' Committee general meeting. "Some Recent Developments in Permanent Building Construction," by Mr. A. J. Willis. 12, Gt. George-street, S.W.1. 5.30 p.m.

THE INCORPORATED ASSOCIATION OF ARCHITECTS AND SURVEYORS (London and Home Counties Branch).—"Dry Rot," by Lt.-Col. B. C. G. Shore, F.I.A.A., L.R.I.B.A. Tudor Room, Caxton Hall, Westminster. 6.30 p.m.

Friday, March 25.

BIRMINGHAM AND FIVE COUNTIES ARCHITECTURAL ASSOCIATION.—"The Spirit of Art in the 18th Century," by Prof. A. E. Richardson. Society of Artists, Birmingham. 6.15 p.m.

FROM "THE BUILDER" OF 1849

Saturday, March 17, 1849.

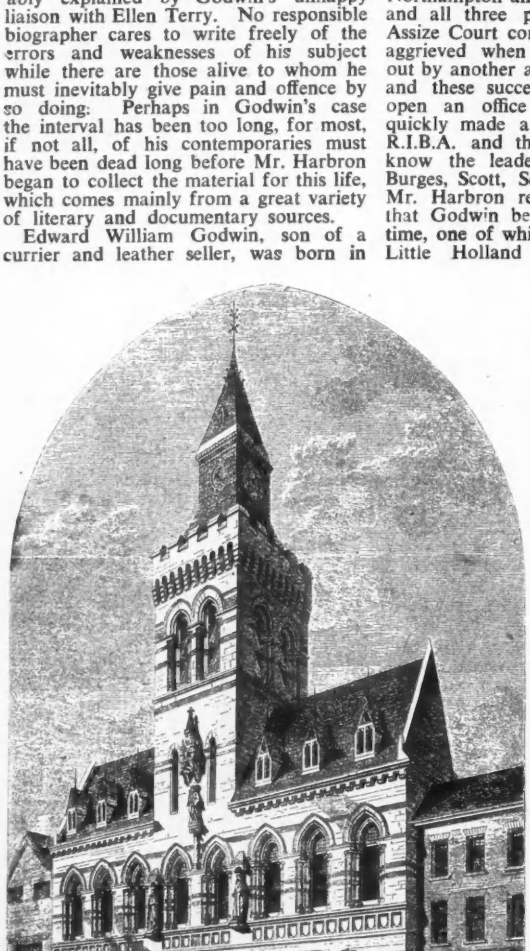
HOUSE-PAINTERS' BRUSHES.—Mr. Nash, a manufacturer, has registered a supposed improvement in painters' brushes: it consists in the use of a metal binding, of circular form, flattened into a somewhat oval shape at the upper part of the brush near the flags of the bristles, with the view to cause the top of the brush to be flattened at the back and front of the same, in order to afford better surfaces for use. The asserted advantages of this arrangement are that by the substitution of the metallic binding for strings wound round the flags of the bristles—as now in common use—or of wire, the brushes are not so liable to come to pieces or allow loose hairs to come out. Whether or not the increased strain on the workman's wrist, slight though the extra weight may be, will be disadvantageous, remains to be seen.

E. W. GODWIN
His Life and Work

E. W. GODWIN—architect, antiquarian, authority on historical costume, a leader of the "Aesthetic Movement," designer of stage settings, of decoration and furniture, author, dramatic critic, friend of Whistler and Wilde and other notabilities, and lover of the young wife of G. F. Watts, R.A., otherwise Ellen Terry—died in 1886. Notwithstanding the prominent part he played in the world of art in his day and generation he has remained a rather puzzling figure, and it seems strange that we should have had to wait till 1949 for a full-length biography of this versatile and extraordinary man. Mr. Dudley Harbron, the author of the "life" just published under the peculiar title "The Conscious Stone" (London: Latimer House, Ltd., price 12s. 6d. net), himself remarks that "the omission is odd," but it is probably explained by Godwin's unhappy liaison with Ellen Terry. No responsible biographer cares to write freely of the errors and weaknesses of his subject while there are those alive to whom he must inevitably give pain and offence by so doing. Perhaps in Godwin's case the interval has been too long, for most, if not all, of his contemporaries must have been dead long before Mr. Harbron began to collect the material for this life, which comes mainly from a great variety of literary and documentary sources.

Edward William Godwin, son of a currier and leather seller, was born in Bristol in 1833. He was articled to William Armstrong, "City Surveyor, Architect and Civil Engineer," who appears to have been more an engineer than anything else. Godwin was soon doing all Armstrong's architectural work (how often the "ghost" flits across the page of architectural history!), and left him because he was not allowed to put his initials on the drawings. Opening up in Bristol for himself (afterwards entering into partnership with Henry Crisp), he soon built up a prosperous practice. (His first work, a church at St. Johnston, County Donegal, was illustrated in *The Builder* during May, 1857.) In his spare time he took a great interest in the theatre, writing dramatic criticism for the local Press, and it was this interest that, in 1861, brought him into touch with Ellen Terry and her sister, Kate, young actresses who were appearing at the Princes Theatre.

Godwin had great success in architectural competitions, winning those for Northampton and Congleton Town Halls, and all three premiums in the Bristol Assize Court competition (he was rightly aggrieved when this work was carried out by another architect on another site); and these successes encouraged him to open an office in London, where he quickly made a mark, lecturing at the R.I.B.A. and the A.A., and getting to know the leaders of the profession—Burges, Scott, Seddon, Edis and others. Mr. Harbron refers to the long walks that Godwin began to take about this time, one of which took him fatefully to Little Holland House to renew the acquaintance of Ellen Terry, now the seventeen-year-old wife of G. F. Watts, R.A., a man thirty-one years her senior. This "spring and autumn" alliance had not proved a successful one, and the handsome accomplished Godwin could hardly have had anything but a disturbing effect upon the disillusioned girl. In the event, Ellen Terry returned to the stage and then, to the consternation of her friends, eloped with Godwin. Charles Reade wrote of her about this time: "She is an enigma. Her eyes are pale, her nose rather long, her mouth nothing particular, complexion a delicate brick dust, her hair is rather like tow. Yet somehow she is beautiful. Her expression kills any pretty face beside her. She is a pattern of fawn-like grace. Whether in movement or repose, grace pervades the hussy. In character—impulsive, intelligent, weak, hysterical; in short, all that is abominable and charming in a woman." It could hardly be expected that one such could settle down in a country cottage with a temperamental artist and make a success of so unconventional a relationship. Although Godwin had a flourishing practice, he was careless about money, and Mr. Harbron tells of two occasions when the bailiffs were on the premises. It is not surprising that the liaison came, in course of time, to an abrupt end.



Congleton Town Hall. An early competition work of E. W. Godwin. (Reproduced from *The Builder* of July 16, 1864.)

From a drawing by the late T. Raffles Davison.

Godwin's practice does not appear to have been a very steady one, and Mr. Harbron records that he occasionally had recourse to helping other architects with their work, notably Burges and Hine and Norman. Finally, dissatisfied with the way in which architectural competitions were managed, or mismanaged, he gave up competing, and resigned from the Institute as a protest against what he regarded as its failure to reform the system. More and more he relied upon the comparatively small commissions of private clients. His office does not appear to have been a large one. Mr. Harbron mentions the names of only two assistants, Beatrice Philip, whom Godwin married when he left Ellen Terry, and Maurice B. Adams, who afterwards became Editor of *The Building News*.

Godwin's move to London opened for him a new and fascinating phase of life. Though he continued to practise architecture he designed no more large buildings. Much of his time was now taken up with designing stage sets and theatrical costume and the study of Japanese art. Becoming a leader of the "Aesthetic Movement," later to be satirised by Gilbert in "Patience," he was described by Oscar Wilde as "one of the most artistic spirits of this century in England"; by Sir Max Beerbohm as "the greatest æsthete of them all." He became a close friend of Whistler, whom he helped with his innovations in interior decoration and the framing and hanging of pictures, and for whom he designed the remarkable "White House" at Chelsea, one of the earliest essays of the Modern Movement. When Whistler was forced to sell this place to pay the expenses of the Ruskin lawsuit he wrote over the Portland stone door: "Except the Lord build the house, they labour in vain that build it. E. W. Godwin, F.S.A., built this one."

Godwin suffered greatly from ill-health towards the end of his life, and died on October 14, 1886, at the age of fifty-three, after an operation for stone.

Mr. Harbron has written a well-informed and much-needed book. The period setting is convincing and well-peopled. Godwin, however, is not as

often in the picture as we should like him to be, and is frequently no more than a figure in the background. Mr. Harbron tells us, no doubt, all that is known about Godwin, who, however, still remains a rather elusive figure. The picture that does emerge of him is not in our view altogether a pleasing one. That he had a captivating personality there can be no doubt. He was a handsome, bearded figure of a man (clean-shaven in later life), a sensitive artist, a good writer and a ready speaker with a charming manner that seems to have appealed greatly to women in particular. But he seems to have been none too scrupulous, either in his professional or his private life. When his partnership came to an end he left Crisp to face a lawsuit in which he was at least equally involved. He eloped with another man's wife only to desert her and the two children she had borne him, to marry his office pupil, Beatrice Philip, who in turn left him for Whistler, whom she married after Godwin's death. There was a kink somewhere.

A. K. Bray. del.

"The White House," Chelsea, designed for J. M. Whistler by E. W. Godwin. (Reproduced from "The Conscious Stone.")

The book will, we should think, be assured of popular success, and it has, of course, a great interest for architects. It includes several illustrations—a pen-and-ink portrait of Godwin by T. Raffles Davison, Watts's painting of Kate and Ellen Terry, and several examples of Godwin's architectural work, notably the dignified warehouse in Stokes Croft, Bristol, the picturesque Dromore Castle, Co. Limerick, a rather German-looking house, Rheinfielden, Northampton, a house at Bedford Park, and the White House, Chelsea, as well as designs for furniture, wallpaper and interior decoration and a drawing of his dignified classic stage set for "Helena in Troas." It is no disparagement of this book to say that there is room for another one dealing fully and exclusively with Godwin's architectural work. Godwin began his professional life as a Gothic Revivalist, but he was too much the creative artist to remain one. Apart from being a leader of the "Aesthetic Movement" and doing much to foster the appreciation of Japanese art, his chief claim to the attention of architects must be his influence as a founder of the Modern Movement. Abandoning Gothic and refusing to follow the path of the "Queen Anne Revival," Godwin, in the White House, at Chelsea, struck a new note in architecture. The design was startling in its simple asymmetricality, with windows and door "where they were wanted" and not arranged with "Baker-street regularity." Unhappily, the Board of Works insisted on changes in the elevation, which spoilt Godwin's design. Nevertheless, it pointed the way to a more functional manner. A fully illustrated account of Godwin's architectural work is overdue and we hope that Mr. Harbron will undertake it. G. J. H.

ARCHITECTURAL ASSISTANTS IN PRIVATE OFFICES

Establishment of Salary Scales

THE intense competition from official architectural departments has made it clear that if private architects are to attract and retain architectural staff, they must offer the security that a salary grading system, with fixed annual increments, provides. Too often the private architect is at a disadvantage because he rarely offers his employees security for the future; indeed, he is not always fortunate enough to envisage a measure of security for himself.

There is no doubt that any measure of stabilisation must benefit not only architects and their assistants but also the efficient and economical production of drawings and the erection and supervision of buildings. There is a tendency, more marked in official departments but also very noticeable in private offices, for a turn-over of staff which is a considerable factor in slowing down the speed of building.

It is of interest, therefore, to note that a number of private firms are attempting to rationalise their salary scales. Two such firms—Arcon, chartered architects, and Sir John Burnet, Tait and Partners—have taken the step of publishing salary scales which they have laid down. They feel that the prospect of future security and automatic advancement will give assistants the recognition they deserve and help to meet the competition for their services and the offers of inflated salaries for temporary posts.

Arcon have graded their assistants according to their standing in relation to the R.I.B.A. examinations. Their scale is:

	per annum
Students who have passed their R.I.B.A. Intermediate examination but who have had no office experience	£350
Students who have passed their R.I.B.A. Intermediate examination and have had a certain amount of office experience ...	£400
Students who have passed their R.I.B.A. Final examination and require office experience to qualify for their A.R.I.B.A.	£550
Fully qualified architects with a certain amount of office experience	£600

Another Grading System.

Sir John Burnet, Tait and Partners classify their assistants under the following heads: Grade 1, Improvers; Grade 2, Junior Assistants; Grade 3, Assistants; Grade 4, Senior Assistants; and Grade 5, Assistant Architects. The rates laid down by the firm are:—

GRADE 1: IMPROVERS, £200-£300 per annum. Four yearly increases of £25, giving the following range:—

	per annum
1st year	£200
2nd ,, ...	£225
3rd ,, ...	£250
4th ,, ...	£275
5th ,, ...	£300

GRADE 2: JUNIOR ASSISTANTS, £330-£450. Four yearly increases of £30, giving the following range:—

	per annum
1st year	£330
2nd ,, ...	£360
3rd ,, ...	£390
4th ,, ...	£420
5th ,, ...	£450

GRADE 3: ASSISTANTS, £480-£640. Four yearly increases of £40, giving the range:

	per annum
1st year	£480
2nd ,, ...	£520
3rd ,, ...	£560
4th ,, ...	£600
5th ,, ...	£640

GRADE 4: SENIOR ASSISTANTS, £650-£850. Four yearly increases of £50, giving the following range:—

	per annum
1st year	£650
2nd ,, ...	£700
3rd ,, ...	£750
4th ,, ...	£800
5th ,, ...	£850

GRADE 5: ASSISTANT ARCHITECTS. At special rates.

Mr. Gordon Tait, F.R.I.B.A., makes the following comments on his firm's plan: "One adverse effect of the salary spiral in the office of a private architect is the unfairness to assistants when newcomers expect higher salaries or offer less skilled services for the same money. As a result, the conscientious employer must constantly think of increasing the salaries of the existing staff to bring them into line with new values. If this point is overlooked or avoided, it breeds dissatisfaction among the staff, who find themselves at a disadvantage after having given loyal service to their employer for several years. A natural reluctance on their part to ask for increase of salary drives assistants to look for employment elsewhere.

"This firm recognises the added financial burden of national insurance and pays the whole cost; this overcomes the irritation of deductions from pay. As to overtime, it has been found that assistants tend to dislike overtime, not on principle but because the cost of meals has not made it worth while To meet this point, a meals allowance is made for every 3½ hours overtime worked."

THE THAMES RIVERSIDE

A Planning Report

THE future of the Thames valley and the preservation of its amenities have attracted a good deal of attention in recent years. In its long course of nearly 200 miles from source to sea the river flows through many counties and the areas of many planning authorities. The report now under review covers only one short section of one bank, a length of 26 miles from the London-Middlesex boundary at the point where the Stamford Brook formerly flowed into the Thames to the Middlesex-Bucks boundary where a branch of the River Colne forms the frontier. This is an important stretch, but the opposite bank, on the Surrey side, is not included, being comprised in the separate schemes of the North-East Surrey and the North-West Surrey Joint Planning Committees. These organisations have worked jointly with Middlesex; and *The Greater London Plan* of 1944, within which the whole of Middlesex is included, has been followed in the framing of their various new schemes. Long before 1944, however, this portion of the river had been under consideration by town-planning experts. The Thames Valley Joint Committee reported in 1923; the West Middlesex Joint Town Planning Committee's report of 1924 included the riverside areas above Hampton Court; and a Joint Committee of the Middlesex and Surrey County Councils issued in 1930 an illustrated survey entitled *The Thames from Putney to Staines*. Thus the problem had already been faced, and numerous valuable acquisitions of open spaces had been made, when the West Middlesex Joint Planning Committee was superseded by the Middlesex County Council last year; but meanwhile a deplorable extension of shoddy "bungaloid" development had taken place, and the need for action has become urgent from several points of view.

The present report* is the work of Messrs. W. R. Davidge and Partners, consultants to the West Middlesex Joint Planning Committee, and is dated June, 1948, though it has only just been published. Compared with some of the bulky and lavish volumes of town planning schemes which have appeared during recent years, it is a very small affair, but its 28 pages of text, although they include ten illustrations, contain a great deal of highly compressed matter, and the two large coloured folding maps accompanying the report show the proposals made by the authors in full detail. These maps are particularly clear and very well printed. Apart from preliminaries, the subject is treated under three main heads: a general survey of conditions affecting the planning of the riverside; detailed proposals for the various localities; and historical notes on buildings and sites worthy of preservation.

As the authors remark at the outset, the Thames is "a national possession. Historically its associations are legion." It serves many utilitarian purposes, and it provides a recreational outlet for the teeming millions of the western suburbs of London. Its liability to serious flooding, notably recalled in March, 1947, is one of the first aspects considered in this report; and the authors support the generally accepted view that the only solution is the prohibition of all building, whether domestic or industrial, in the areas subject to floods. All the possible alternatives—the construction of reservoirs and embankments, or the enlargement of the river channel and weirs—are rejected as too costly, impracticable, and destructive of all the river's most attractive features. In certain areas now built up, the proposed sterilisation would involve the ultimate demolition of many existing buildings, but even this drastic measure would be far more feasible than the alternatives just mentioned. As for the remaining areas, the prohibition of future building would be an unmixed blessing, for the long ribbon-lines of shoddy riverside bungalows and shacks, mostly erected between the two wars, are not only liable to complete isolation in severe floods but are lacking in sanitary provision, and any increase of such building is to be regretted.

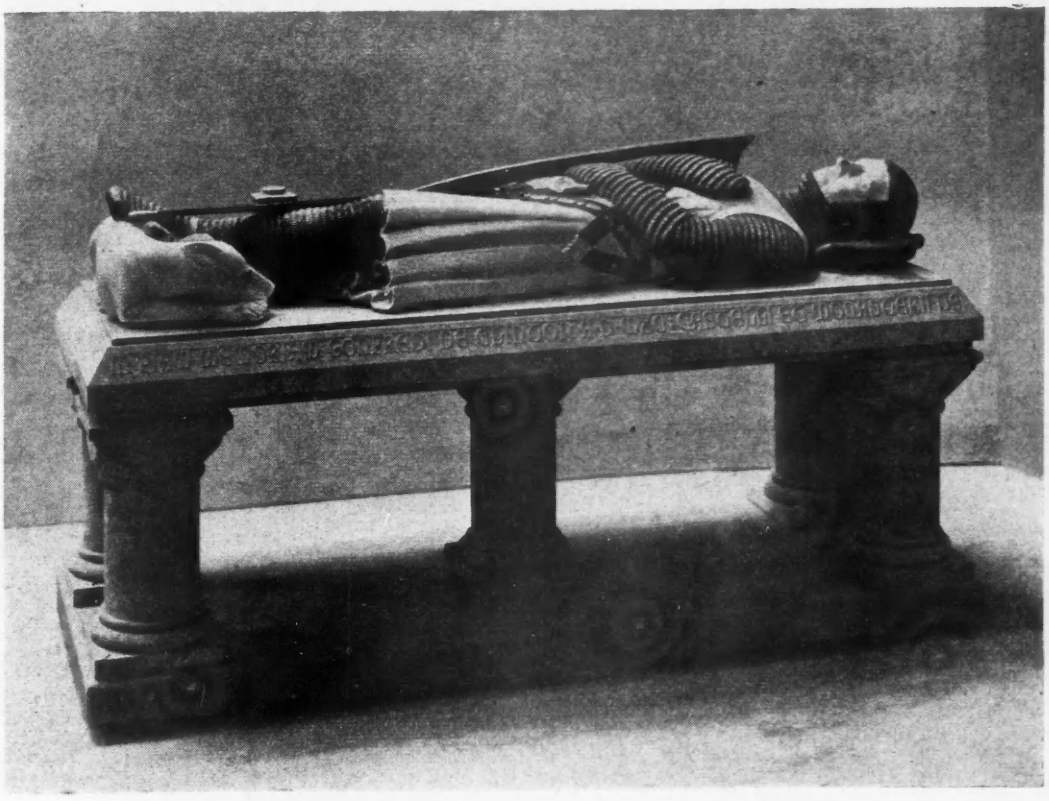
If the ban were to be enforced immediately, miles of riverside meadows would be automatically saved from the worst effects of indiscriminate enterprise. The report recommends the clearance and redevelopment of riverside areas in two stages: "short-term clearance (areas where no proper access exists, no services have been provided, and the buildings are constructed of short-lived materials and are unattractive in appearance)"; and "long-term clearance (areas where certain services have been provided and the buildings are of a mixed type, but which, by reason of the location and appearance of the buildings, should eventually be cleared in the interests of long-term planning)." No further extension of industry in this part of the Thames valley is considered probable or desirable, with the sole exception of boat-building, which the authors would encourage. They assume that gravel-digging on a very large scale must continue, because "the Thames gravel terraces provide an exceptionally good aggregate for concrete, a material for which there is a large demand at the moment, and a demand that is likely to increase when building restrictions are eased." They uphold the recommendation of *The Greater London Plan* that this work should be prohibited within a quarter of a mile of the river; but they offer no suggestions for dealing with the vast excavated meres that may now be seen near Ashford, as well as at Ham and elsewhere on the Surrey side. The towpath, about which there has been so much welcome discussion of late, exists throughout the 26 miles of river frontage now under discussion, on one side of the river or the other, but has long ceased to serve any other industrial function, and has now become a recreational promenade. Some additional foot-bridges are recommended to improve its attractions. New cross-river road-bridges, to carry authorised arterial roads and other highways, remain to be constructed near Barnes Bridge, probably near Laleham House ("Exeter Radial Road"), and possibly near Sunbury ("D Ring Road") and near Teddington.

The following are the authors' main detailed proposals, taken in order upstream from Chiswick to Staines. Chiswick Mall, with its charming riverside houses and gardens, should be preserved on architectural grounds. The future of Chiswick Eyot is left in doubt, though measures are now under discussion for its preservation. The industrial area near Chiswick Church must remain. The existing promenade and public gardens all along the riverside to the new Chiswick road-bridge are properly commended and the hinterland of sports grounds, etc., should be acquired as a permanent public open space. Cubitt's Basin, north of Chiswick Bridge, should become a boat-house and boat-building workshop, the surrounding cluster of shacks and caravans being eliminated. The next mile, to Kew Bridge, is zoned as a residential area and is now largely built up. It includes Strand-on-the-Green, which "should be treated as a Special Area for Architectural Control." Oliver's Island should be tidied up, and further building upon it should be prohibited. Next comes the grim mile of Brentford, with its "immense and notorious" gasworks and docks. "*The Greater London Plan* somewhat optimistically shows the Gas Light and Coke Co.'s premises as local green belt, but we cannot see that from a practical point of view this will be possible, at any rate, for a great number of years." The authors, therefore, regretfully swallow Brentford as a bitter pill, only urging that Brentford Ait, with its trees shielding the gasworks from Kew Gardens across the river, should be raised in level. The splendid expanse of Syon Park, adjoining Brentford and used by the Duke of Northumberland as his private residence, should ultimately be acquired as a public open space, the mansion being left standing. In Isleworth itself, some industry must remain, but the picturesque riverside corner should become a "Special Area for Architectural Control." From this point, all the way past Richmond Bridge to Twickenham, a distance of about two miles, there should be a continuous strip of public open space along the river bank. Marble Hill Park and some other portions of this have already been acquired. Then comes the mile of built-up Twickenham, with some short lengths of existing public open spaces. Here the report recommends the zoning of the riverside and Sion Row, together with some short lengths of open spaces, as "Special Areas for Architectural Control." From Teddington Lock to a point half-a-mile short of Kingston Bridge a public riverside strip is proposed. A short stretch of "residential area" brings us to Kingston Bridge: then the next two miles to Hampton Court are mercifully open, but the report recommends that the narrow strip still in private ownership, between the public riverside walk and Hampton Court Park, should eventually become a public open space. The group of houses above Hampton Court Bridge and on the Green should become another "Special Area for Architectural Control," as should a small area around Hampton Church. The huge group of reservoirs between Hampton and Sunbury could be improved by planting.

The remaining nine miles from Sunbury to Staines contain several patches of shocking and promiscuous development which should be cleared sooner or later: above and below Shepperton, opposite Laleham, and above Penton Hook. The whole of the Middlesex bank and its immediate hinterland from Sunbury to the outskirts of Staines—except for small residential areas at Shepperton and Laleham—should then become public open space, some part of which has already been acquired. The southern outskirts of Staines are left unaltered, but a continuous stretch of riverside gardens is proposed from the railway-bridge to the county boundary, and also an extension of the popular Lammas Recreation Ground. To anyone who has known the river above Hampton Court for many years, the appalling growth of settlements of flimsy caravans and shacks, between the wars, together with recent evidence of their fate in time of flood, affords abundant justification for the sensible proposals made in the report to preserve the amenities of this beautiful and accessible part of the Thames.

M. S. BRIGGS.

* REPORT ON THE THAMES RIVERSIDE FROM CHISWICK TO STAINES. By W. R. Davidge and Partners. (London: Middlesex County Council.)

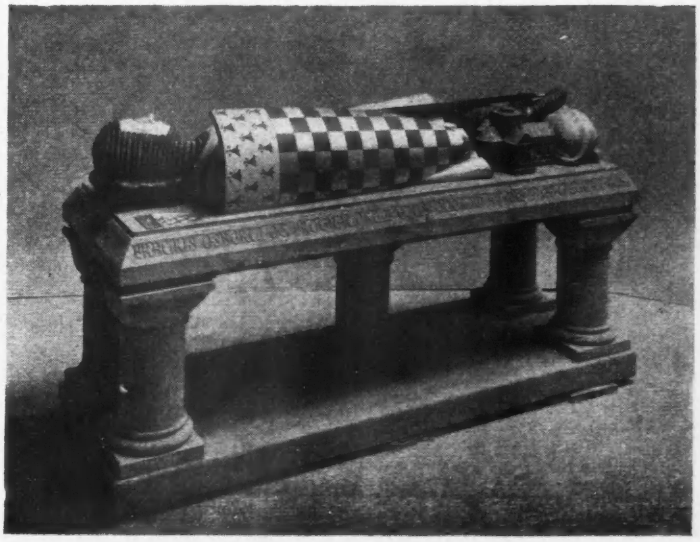


THIS cenotaph has recently been erected in the Pilgrims' Church, Walsingham, Norfolk, to the memory of Geoffrey de Clinton, a Norman knight (1090 A.D.), his brother Osbert and his direct descendants. Blue Hornton stone was used with tooled finish to masonry, and the figure depicts a typical knight of that period, carved and emblazoned in heraldic colours. The Latin inscription in relief Lombardic characters round the chamfer of the table records that Geoffrey de Clinton founded Kenilworth Priory, and in the sculpture a scale model depicting that building is carved. The figure is further enriched with three Coats-of-Arms held by the family in the intervening centuries, and the greyhound at the feet has also heraldic significance. The sword and the face are in cast bronze inserted in the stone, the latter being a portrait modelled from life of the features of the one surviving member of the centuries old family. The whole was the work of Messrs. E. J. and A. T. Bradford, under the direction of the architects, Messrs. Milner and Craze, FF.R.I.B.A.

CENOTAPH
in the
PILGRIMS' CHURCH, WALSINGHAM, NORFOLK

MILNER and CRAZE, FF.R.I.B.A., ARCHITECTS

CARVED BY E. J. and A. T. BRADFORD



PRACTICE NOTES ON DEVELOPMENT CHARGES, TOWN AND COUNTRY PLANNING ACT, 1947—2

By Norman P. Greig, B.A., Barrister-at-Law, F.R.San.I., F.I.Arb., etc.

THE purpose of these articles being, not to repeat the substance of the Act and any Regulations under it, but rather to comment, when thought necessary, on the policy and working rules to be adopted by the Central Land Board in the "light of their present experience," we select below some matters of interest to builders and architects, particularly which in one or two cases invite criticism. those which in one or two cases invite criticism.

PART I. LIABILITY FOR DEVELOPMENT CHARGE

PLANT AND MACHINERY. These words, in the absence of any statutory definition, are to be given their ordinary meaning and (1) the Board will not assess a development charge for the erection of plant and machinery of any kind *within* a building; but (2) if erected *outside*, and when erected will be itself a building, structure or erection, such *will* attract development charge. "Within," in this connection, means within the confines of the building taken for Third Schedule measurements. A code of measurements is given in Appendix A to the Notes (paras. 6 and 21).

MATERIAL CHANGE OF USE. The term "change of use" will probably not cause any problems, but "material change of use" might. The Board therefore call attention to the contents of Circular No. 69 (issued February 15, 1949), wherein it was suggested that a change *in kind* will always be material (house to shop, etc.), but a change *in degree* may be material if very marked (e.g., change from private residence with lodgers, to a declared guest house). Where the change of use affected a *part* of a building still used as a whole, the above Circular stated that the Minister would take the view that "material change of use" would be decided in relation to the whole, and not the part. But the use of part of a dwelling-house as a shop would be a material change in use (para. 7).

REBUILDING. (This, by para. 1 of the Third Schedule, does not attract development charge.) The Board take the view that a "new" building cannot be a rebuilding of an "old" one unless the old one is pulled down before the new one is brought into use; also that if an old building is "rebuilt," the new one must be within the curtilage of the old one. ("Old" building apparently means an "existing" building, and not an "old" building as such for the purposes, for instance, of the London Building Acts.)

ENLARGEMENT. (Another of the "tolerances" under the Third Schedule, and not attracting a development charge.) The Board point out that a pair of semi-detached houses cannot have the 1,750 cu. ft. allowed to each of them aggregated, and added to *one* of them only without payment of a charge (para. 19). (This is rather to be assumed from the wording of the Schedule itself, but the Practice Note clears up any doubt on the matter.)

UNFINISHED BUILDINGS. By S.78 of the Act, there is exemption from development charge, under certain circumstances, given to an unfinished building, or alteration to a building, where begun before July 1, 1948 (the "appointed day"). Practice Note 25 explains in this connection that where an owner, before the completion of a building or alteration, decides to put up something *larger* than, or *different* from, what was originally contemplated, a development charge will be assessed on the basis that the unfinished building as originally contemplated could have been completed without liability to charge. The charge will therefore represent the difference in value of the right to complete the intended building and the "unfinished building." (This is subtle. One may perhaps remark here that the Board, in their desire to be frank and helpful, have further complicated what was originally anything but simple. The assessment of these abstract values cannot be easy, and is bound to result in dissatisfaction in many cases.)

PART II. GENERAL PRINCIPLES FOR ASSESSING DEVELOPMENT CHARGE

This Part will not prove easy reading to anyone but, perhaps, a valuer. Starting with the assertion that, in normal cases, the difference between Consent Value and Refusal Value (two new terms coined by the Board,—see our previous article) represents the development charge, the Board admit, quite candidly, that the *application* of the simple basis stated above will depend upon the meaning of "value," the term being undefined in the Act and Regulations issued under it. "Value," say the Board, with truth, can have many meanings—value to the owner is one, while value to the C.L.B. is another. (No one will dispute that fact; the developer, naturally, will hope that the latter value will, in practice, tend to approximate to his assessment of the former.) In evaluation, in brief, a sale will be assumed in intention, and "value" will take the form of a "market value," both seller and purchaser being assumed to be "willing." Paragraph 37 quotes an extract from a Privy Council judgment elaborating this principle, and the Board say it provides an accurate description of the persons and the circumstances which must be assumed for fixing both Consent and Refusal values. The remainder of this Part deals with Special Purchasers (para. 38), one available Purchaser (para. 39), and the Before and After Valuation (para. 40). The Board then proceeds to state that there have been suggestions "in one or two quarters" that there can be no additional value from a planning permission to erect a building or use land or a building in such a way that a pecuniary net profit either cannot or will not be made, and that in both these cases there should be no development charge. The Board cannot, however, accept such a suggestion.

THE STATUTORY DEVELOPER. The Board do accept the principle that, in assessing development charge, they should try, whenever possible, to ensure that the price paid for land ready for immediate development at its correct existing use plus the development charge should not exceed the price that would have been paid for the land had not the Act been passed. This, of course, is merely a reiteration of what has been well understood, and expressed in the original Explanatory Memorandum, and elsewhere.

To sum up the matter of "value," the Board say they are not adopting as such any of the rules of valuation given in S.2 of the Acquisition of Land (Assessment of Compensation) Act, 1919 (so familiar to architects, surveyors, and valuers); nor value to the seller nor to the buyer, nor will they adopt *to its full extent* special value to the special purchaser. They propose to adopt the working rule expressed in the Privy Council judgment mentioned above and use the principles explained in these Notes. (These principles are complicated and largely abstract. They express tendencies rather than lay down definite rules. To that extent they cannot give any great degree of satisfaction to the prospective developer, at any rate.)

PART III. DEVELOPMENT CHARGES ON VARIOUS TYPES OF PROPERTY

SINGLE HOUSE AND GARDEN. It is suggested "in some quarters," say the Board, that by limiting the planning application (by which is presumably meant the consent to develop) to the size of the land actually required for the building operation proposed and with no regard to normal curtilages or gardens, a reduction of the normal development charge would result. This reasoning will not be accepted, and in such a case the Board will assess the charge so as to produce the *real additional value* of the planning permission (para. 64). If planning permission is given for the erection of a house with a garden larger than the normal for the type and situation of the house, the development charge will not necessarily be *pro rata* for the excess area of the garden (para. 65). Again, though houses are in fact erected in all sorts of positions for special ownership or occupation (farm-house, tied cottage, caretaker's house, vicarage, lodge and almshouse), and let at a rack-rent, or nominal rent, and occupied by a service tenant or by the owner, the Board will pay no attention whatever to these matters when assessing development charge either on erection or extension. The *size* and *situation*, however, can be very relevant matters, and all will get the same assessment for the same house in the same place. For the assessment a "notional freeholder" is the owner, and for purposes of collection the Board will be ready to consider the circumstances of the actual developer. (See S.71 of the Act.)

(To be continued.)

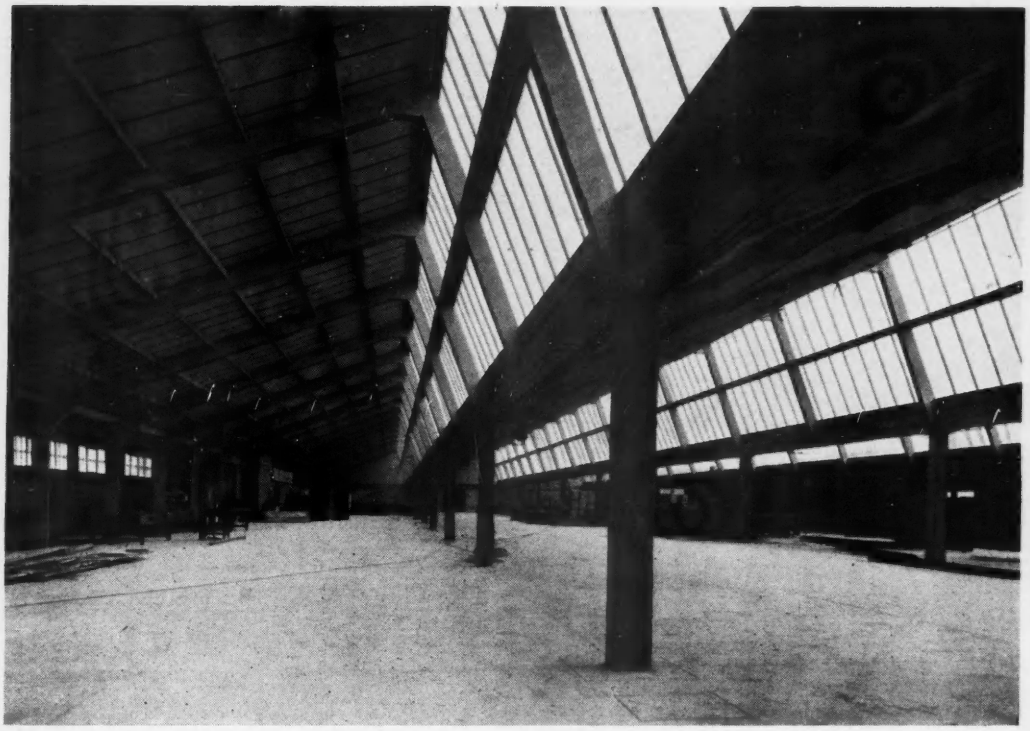
FIRST COMPULSORY PURCHASE ORDER

THE Central Land Board have made a Compulsory Purchase Order in respect of a plot of land at Southcroft-road, Orpington. This is the first Order the Board have made under the Town and Country Planning Act, 1947.

A planning permission for the erection of two bungalows on the plot—which is about 1/5th of an acre—was granted to Mr. F. Berge, architect, by Orpington Urban District Council in May, 1947. Notice of the Order has been served on Mr. J. C. Walker, Mrs. Margaret Avery, and Mr. A. I. Todman, the last two being the personal representatives of Percy Ellis Avery, deceased.

An Appointment at Wallasey.

Wallasey (Wirral) Town Council has appointed Mr. Harry Crowther to the post of Borough Engineer and Surveyor at a salary of £1,450 rising to £1,600 a year. He takes office on April 1, when the present borough engineer and surveyor, Mr. R. F. Brooks Grundy, leaves for a similar post at Wandsworth.



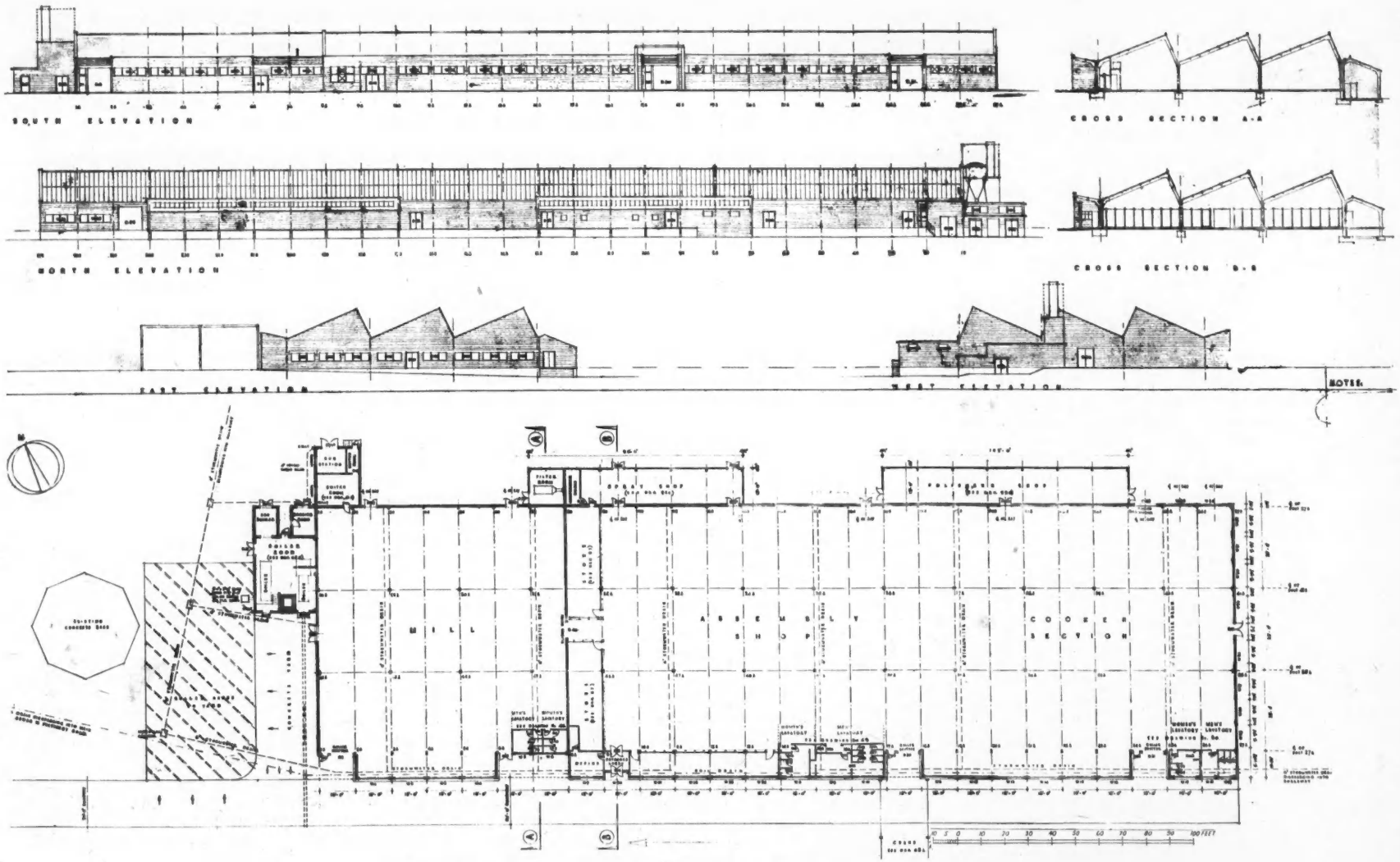
Interior view. *Below*: **General view of exterior.**

FACTORY AT CROWE PARK, GILLINGHAM, KENT
for Easiwork, Ltd.

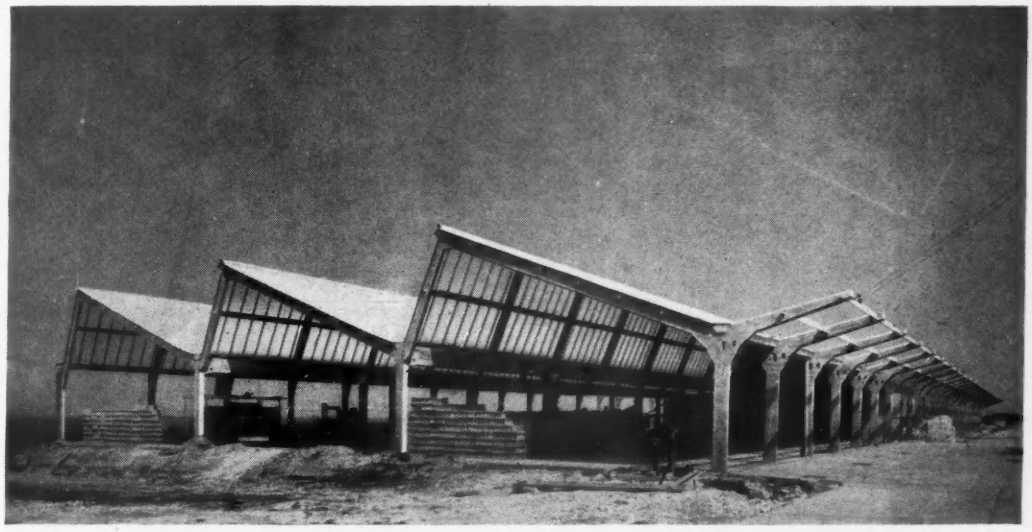
JOSEPH EMBERTON, F.R.I.B.A., ARCHITECT

THE planning and design of this factory strike a high level of clean, graceful lines with unobstructed light. Although strictly functional, the building has achieved an atmosphere internally of spaciousness and light which are considerable aids to production. The structure is an advanced design. Built up of prefabricated reinforced concrete units with dry-bolted joints, the steel content is low, the reinforcement in the members being under 2 lb. per sq. ft. floor area. The main frames, purlins and gutters are cast in reinforced concrete and require no maintenance. Holes for conduits and other services are cast in the members, and the rainwater pipes are cast in the internal columns and discharge into drains running under the factory floor. The trough-shaped gutters are cast in concrete, lined with bitumen sheets, and span from frame to frame. Insulation board is fixed under the corrugated asbestos sheets and over the purlins, and is supported on steel tees at 2 ft. centres spanning between purlins. The structure along the front road is a 10 ft. cantilever. The front wall is non-structural and takes no roof load. The in-filling is of hollow foam-slag blocks, of high insulation value.

The structure is on the "Lamba" system, and is the logical breaking-up of a monolithic rigid-frame structure into transportable sections without detracting from the economy and functional simplicity achieved by advanced design. The consultants engaged were: Messrs. Widnell and Trollope, quantity surveyors; Mr. L. Rayner, heating and ventilation; and Mr. A. C. Gibbons, lighting. The reinforced concrete design was prepared by the London Ferro-Concrete Company, who also acted as general contractors. Sub-contractors and suppliers engaged upon the work will be found on page 337.



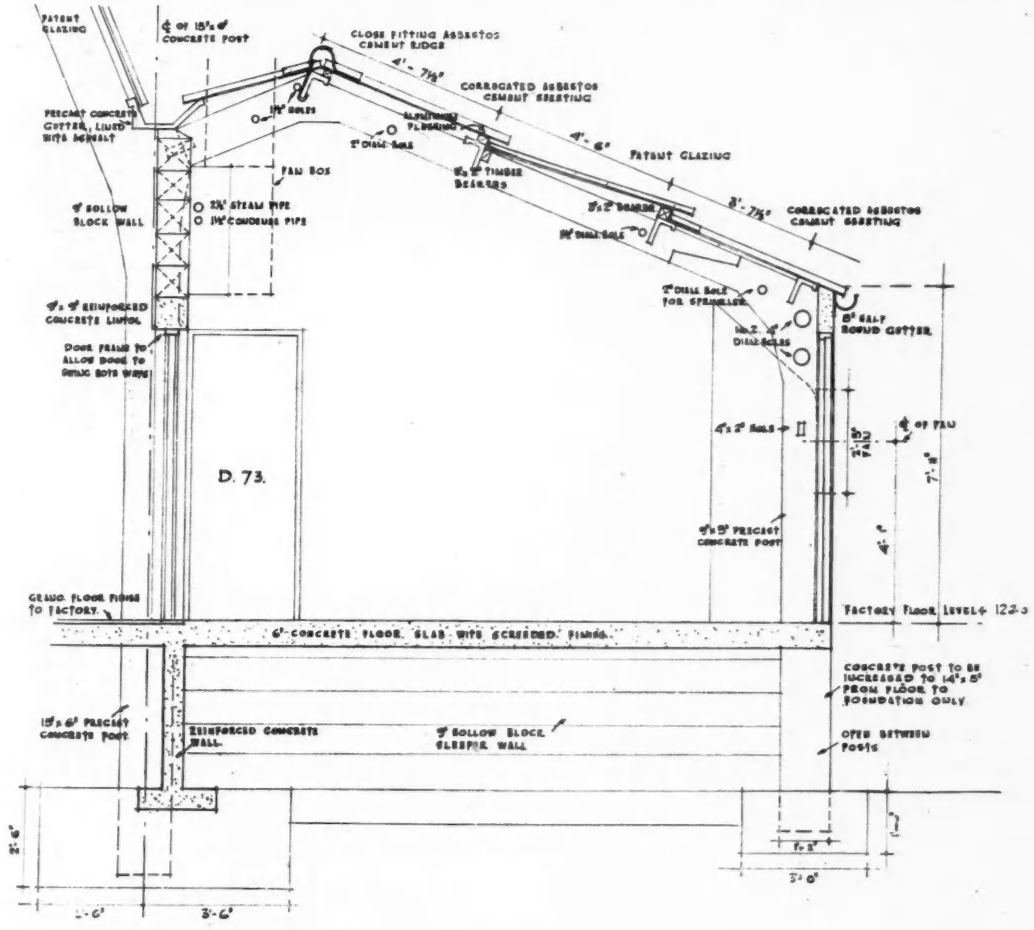
FACTORY AT CROWE PARK, GILLINGHAM. Plan, elevations and sections.

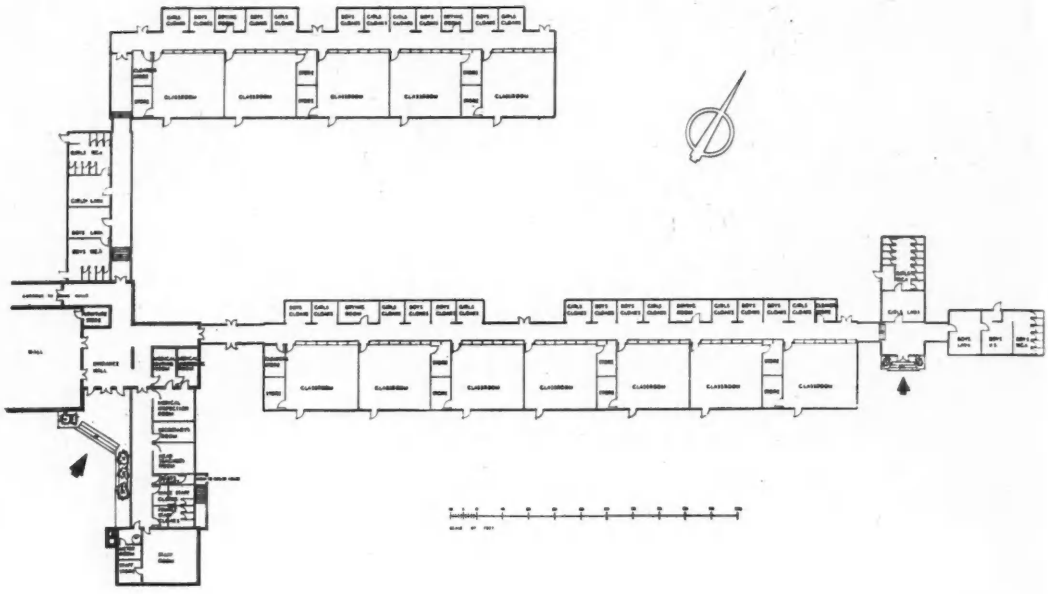


View showing roof structure complete. *Below*: **Section through polishing shop.**

Sub-contractors and suppliers engaged were:—

Asphalt and roofing felt, William Briggs & Sons, Ltd.; concrete blocks, Atlas Stone Co., Ltd.; bricks, Snodland Silica Brick & Stone Co., Ltd.; special roofings, Boddy Roofing Co., Ltd., and Universal Asbestos Co.; glass, Pilkingtons, Ltd.; patent glazing, Williams & Williams, Ltd., and Mellowes & Co., Ltd.; patent flooring and plaster, Malcolm Macleod & Co., Ltd. (Granolithic & Ironite); waterproofing materials, Bodec, Ltd.; central heating and boilers, and ventilation, Walter Cowen & Co., Ltd.; electric wiring, Easiwork, Ltd.; electric light fixtures, Benjamin Electric, Ltd.; plumbing, A. Grant & Sons; sanitary fittings, John Bolding & Sons, Ltd., and Stitsons Sanitary Fittings, Ltd.; door furniture, Taylor Pearse & Co.; casements and window furniture, Crittalls Manufacturing Co.; rolling shutters and fireproof doors, Mather & Platt, Ltd.; wood refuse collection, Air Plants, Ltd., and Rex Stainless Cisterns; sprinklers, Atlas Sprinkler Co.; joinery, Easiwork, Ltd.; and signs, Lettering Centre.





A PERMANENT SCHOOL IN ALUMINIUM, BRISTOL

J. NELSON MEREDITH, F.R.I.B.A., CITY ARCHITECT

CONSTRUCTED from prefabricated units developed by the Bristol Aeroplane Company (Housing) Ltd., Lockleaze Primary School, Bristol, is the first permanent prefabricated school in aluminium to be erected in Britain.

Layout of the school has been largely dictated by the long and narrow shape of the site of 9½ acres. It is based upon two parallel blocks of seven and five classrooms each, both facing south-east. Focal point of the plan is the entrance hall, off which run the administration and larger classrooms blocks, the connecting corridor to the smaller classrooms block, the assembly hall and dining halls. Each classroom has its own cloakroom space with seats and shoe lockers in a recess off the corridor opposite to the room it serves, and each has a large store room. General stock rooms and caretakers' rooms are spaced regularly about the school.

Apart from the entrance, assembly and dining halls, the kitchen and tank tower, all accommodation is of "Bristol" prefabricated aluminium unit construction.

The aluminium buildings were erected complete at the Romney Avenue site by the Bristol Aeroplane Company (Housing) Ltd. upon previously prepared concrete rafts. With the exception of some of the roof units, which were partly assembled on site, the sections were delivered from the Weston-super-Mare factory complete with internal and external cladding and glazing, so that after erection the only work to be done consisted of laying floor finishes, decorating and installing engineering services and equipment.

The aim has been to provide educational authorities with a range of standard units which can be assembled in different ways to provide the buildings needed in a modern school. No attempt has been made to evolve a standard school or a standard classroom, as it was felt that this approach could only lead to monotony of design. Flexibility of the scheme, it is stated, is such that a sketch plan for any traditional type of school can be reconciled without difficulty to unit construction, while conserving the architect's main characteristics.

All units are of a standard 4 ft. width, although heights are varied. Roof sections incorporate structural frame, weatherproof external skin, internal ceiling, and acoustic and thermal insulation. Each section is formed of 20-gauge aluminium sheet, to which a layer of millboard is secured, and riveted in the factory to aluminium purlins, which in turn are riveted to two light trusses at 4 ft. centres. To the underside of these is fixed the finished ceiling, consisting of insulating board overlaid with a glass silk quilt to give the necessary thermal and acoustic insulation. Deep eaves to the roof prevent glare.

Wall sections are built so that the glass area can be varied vertically by insertion of a solid panel. A wall unit may therefore have no windows or be entirely glazed; the front elevations of the Lockleaze classroom blocks present, in effect, a wall of glass, giving bright and airy classrooms.

Side mullions of the wall panels are bolted together to form the structure frame of the building and the subframe to the windows. The panels are bolted at the base to the perimeter channel and at the top, by means of a special section, to the roof. Wind loading is taken up in the bracing between corridor and classrooms—which provides locker space—and by triangular bracing diaphragms attached to outside walls.

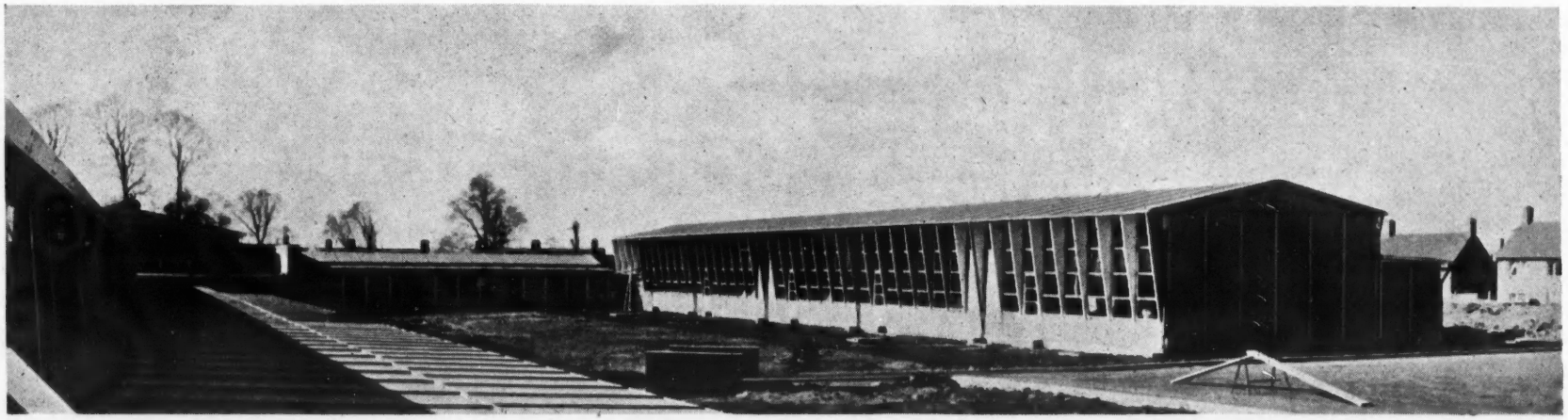
End walls, where the sections are not joined to traditional-type buildings, are formed from corrugated sheeting in framed panels filled with glass wool, and the wall panels separating corridors from classrooms also incorporate locker units.

Erection of the prefabricated school units is extremely simple and no skilled specialist contractors are needed.

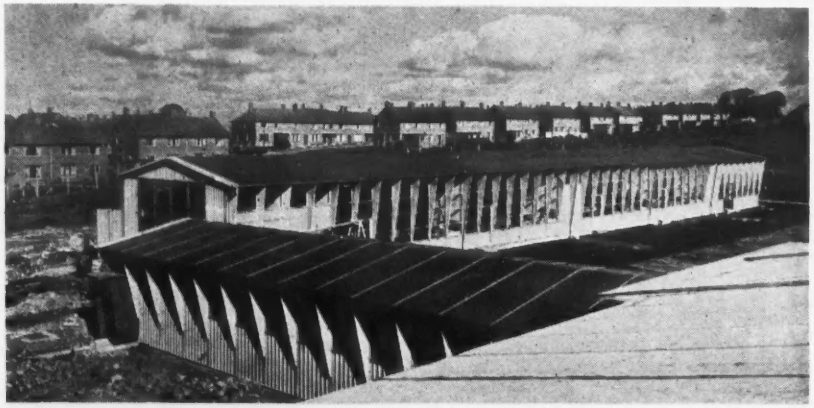
To begin erection, the aluminium perimeter channels are bolted to the edge of the concrete foundation. The wall units are then up-ended and braced into position until a gable or cross wall has been inserted, when the roof can be added. The light weight of the roof units enables them to be handled without cranes and guided into position by two men with tackle.

Built-in equipment in each classroom includes aluminium recessed cupboards. Any form of heating, from local radiant units to a centralised sub-floor system, can be employed. Lockleaze school will eventually have low pressure hot water radiators supplied from gas-fired boilers, but, until this system is available, classrooms and staffrooms only are heated by a temporary installation of electrically heated radiating panels.

Roofs, window frames, cills, gutters and vertical posts are left in their natural bright finish. Windbraces and doors are painted in bright contrasting colours to give variety. The internal decoration scheme generally is based on light neutral-coloured surfaces with bright contrasting colours for doors, aluminium skirtings and windows being left in their natural finish. Floors in the classrooms are of composition tiles, and in the corridors and cloakrooms of coloured asphalt. Walls are of hardboard with standard fibreboard in the classrooms above an 8 ft. level.

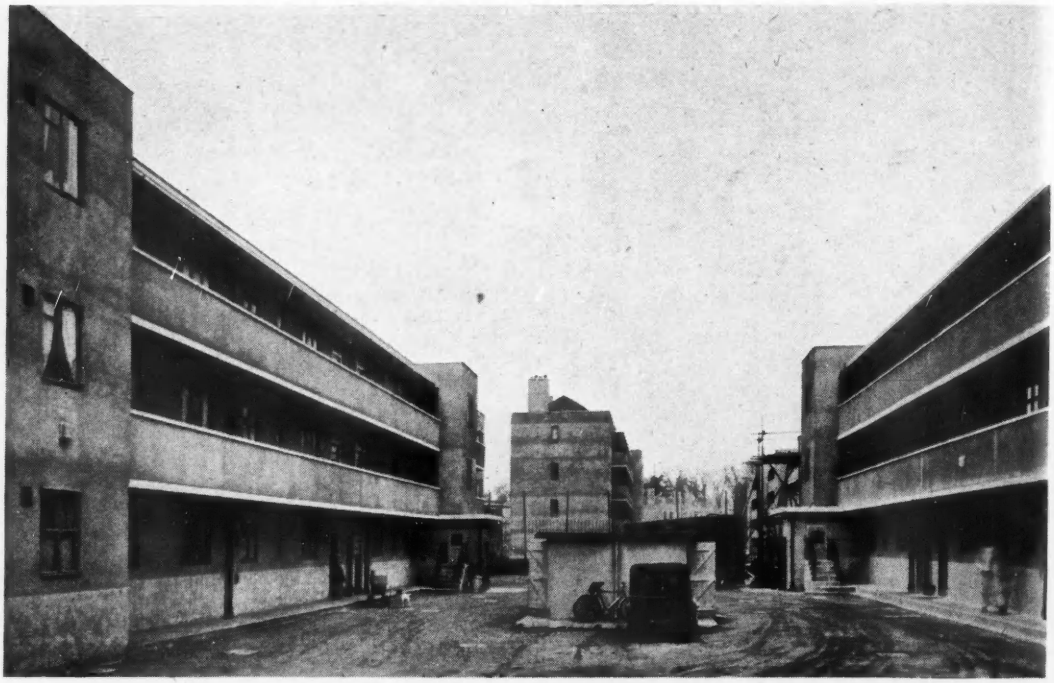


PERMANENT SCHOOL IN ALUMINIUM, BRISTOL : A classroom block from the East, with roof to cloakrooms on the left.



Classroom and lavatory blocks from the South.

Entrance to classroom block, showing cloakrooms and corridor.



View of Willmott House (Block 10, left) and Morse House (Block 8).

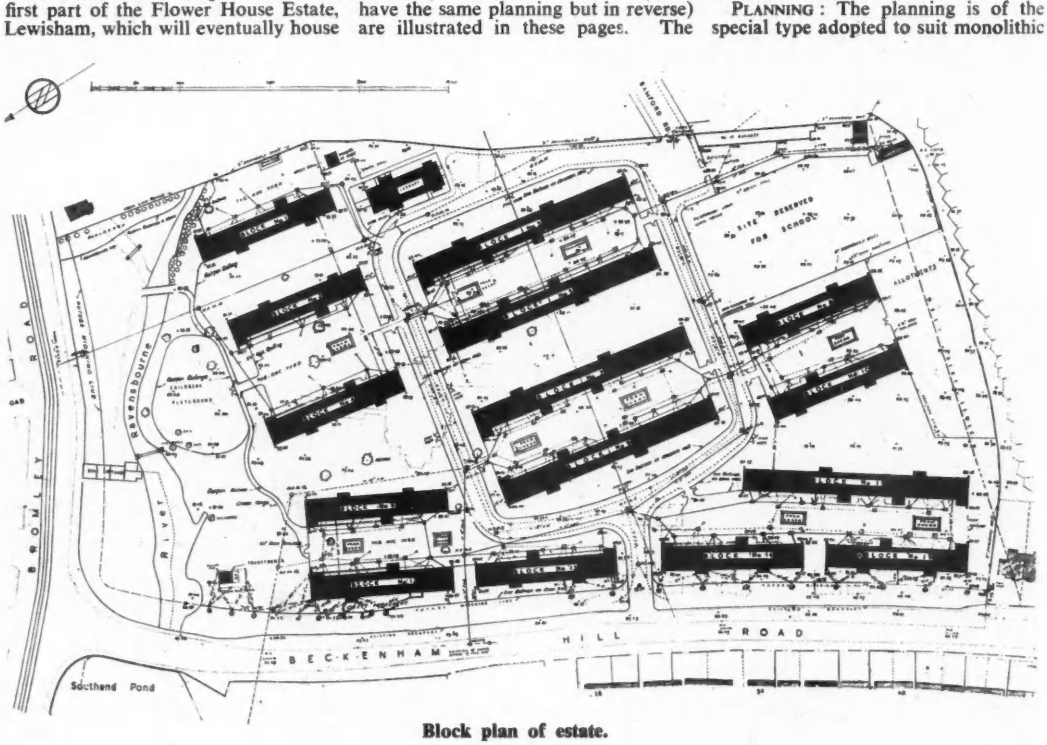
L.C.C. HOUSING ON FLOWER HOUSE ESTATE, LEWISHAM

C. H. WALKER, O.B.E., L.R.I.B.A., DIRECTOR OF HOUSING AND VALUER

S. HOWARD, L.R.I.B.A., HOUSING ARCHITECT

THE Rt. Hon. Herbert Morrison, Lord President of the Council, on March 11, opened "Morse House." This marked the completion of the first part of the Flower House Estate, Lewisham, which will eventually house 350 families in 15 blocks of flats, of which five will be 4-storeyed and ten 3-storeyed. "Morse House" and its twin, "Willmott House" (these have the same planning but in reverse) are illustrated in these pages. The river Ravensbourne runs through the northern part of the estate and will remain a natural feature for the benefit of the tenants.

PLANNING: The planning is of the special type adopted to suit monolithic



Block plan of estate.

concrete construction. The flats are self-contained, with the front door opening from the balcony into an entrance hall. Each flat has a kitchen, a bathroom and a separate water closet, all situated on the balcony side. A private balcony overlooking the gardens is provided to certain of the flats. In all the flats space-heating for the living-room is provided by a solid fuel fire with a back boiler which supplies hot water to the kitchen sink, bath and lavatory basin. The principal bedroom is fitted with a gas or electric fire, the remaining bedrooms being provided with facilities for electric heating. Each flat has a fitted dresser, a broom cupboard, and a fuel bunker, and wardrobe cupboards are fitted in all bedrooms. The standard system of refuse disposal in L.C.C flats has been adopted, i.e., a vertical pipe duct with receiving hoppers at each floor adjoining the staircase, conveying refuse to dust-tight chambers at ground level.

COMMUNAL AMENITIES : In addition to the flats, a laundry, a community room, a chapel of rest, a tenants' workshop, an estate workshop, 165 perambulator sheds, stores, 18 garages and a children's playground with standard fitments are to be provided. A temporary laundry has been provided for use pending the completion of the permanent building. It is to the laundry building that the tenants' workshop or hobbies room is attached, and on the floor above is the club room or assembly place, with seating accommodation for 120 persons, stage, dressing-room, kitchen for preparing light refreshments and the necessary toilet facilities.

CONSTRUCTION : The form of construction is monolithic *in situ* reinforced concrete. The load-bearing walls are seven inches thick. Front walls of the balconies, four inches thick, are provided with precast concrete coatings, as also are the parapets. Wood wool slabs are used as permanent shuttering and linings for the inner face of the external walls and to both faces of the party walls. The exposed face of the wood wool lining is plastered.

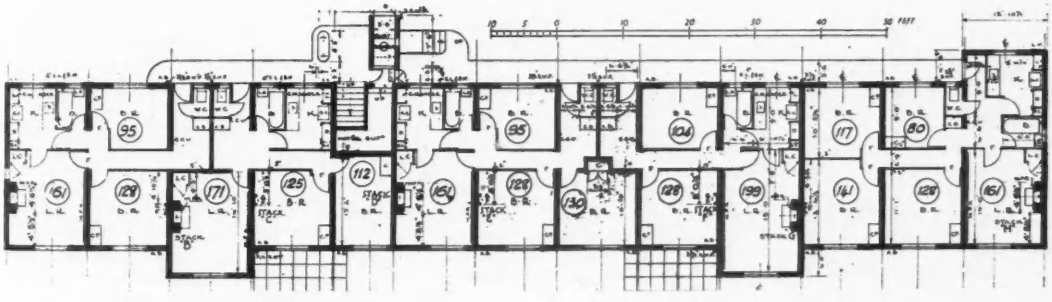
The walls and ceilings are distempered, the dadoes being treated with plastic paint finish; a terrazzo finish is given to the dadoes and to the staircase walls. Two contrasting finishes are used for the outer face of the external walls. A pink or buff-coloured rough cement finish is applied to give a required texture, the plinth up to ground floor window-cill level being rubbed to give a differing light refraction. The roofs are pitched, the covering being of double Roman pattern Bridgwater sand-faced tiles.

The work on the site, which commenced in February, 1947, has been let under contract to Kent and Sussex Contractors, Ltd., of Sidcup, at a price totalling approximately £467,000. The overall cost of the scheme is estimated to be £600,000.

The rents (including rates) for the various sized flats are as follows:—1 room, 14s.; 2 rooms, 16s. 10d.-17s. 4d.; 3 rooms, 20s. 3d.-22s. 2d.; 4 rooms, 23s. 10d.-25s. 3d.; and 5 rooms, 27s. 9d.

An entrance to Morse House (Block 8).

The principal sub-contractors were : Glazing, Aygee, Ltd.; joinery, Rippers, Ltd.; painting, South London Decorators; plastering, Plastering, Ltd.; plumbing, J. Martin (Brockley), Ltd.; roof tiling, W. Creighton, Ltd.; structural steel, H. Moxon; wall and floor tiling, Parkinson (Wall Tiling), Ltd.; wrought ironwork, R. Smith (Horley), Ltd.; clinker partition slabs, Beachcroft Concrete Slab and Block Co.; electrical work, Electric Contracts (London), Ltd.; fire surrounds, W. B. Simpson and Sons, Ltd.

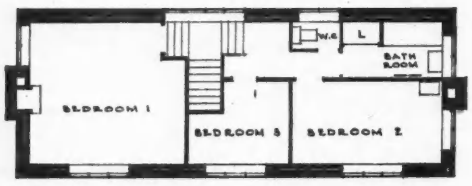


Ground-floor plan of Willmott House (Block 10). The plan of Block 8 is similar, but in reverse.

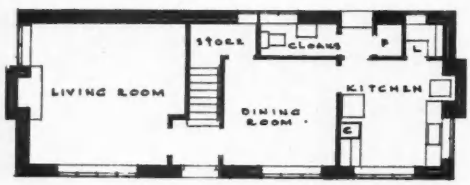
The entrance front.

COTTAGE IN LOCAL STONE, BROADMAYNE, DORSET

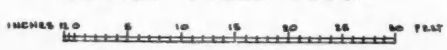
DESIGNED for Commander E. W. Reep, R.N., this cottage of 922 sq. ft. area was completed in January, 1947, at a cost of £1,170—a price which did not include such outside work as paths or fencing. The external walls are of 8-in. limestone rubble, with quoins of off-cuts from the saw mills. Lintols are of reinforced concrete, and the entrance door of laminated oak, resin-bonded. The cottage, which was exhibited at the recent display of stone housing at the Housing Centre, was erected by the Dorchester Building Guild, of Church Street, Dorchester.



FIRST FLOOR PLAN



GROUND FLOOR PLAN.



E. WAMSLEY LEWIS, A.R.I.B.A., ARCHITECT

CORRESPONDENCE

Drawing Office Materials.

TO THE EDITOR OF *The Builder*.

SIR,—I was interested to read Mr. Shannon's letter on the subject of pencils published recently in *The Builder*. I would like to draw the attention of your readers to the fact that this matter had previously been the subject of discussion by the Council of the R.I.B.A., and that on February 12 a letter was sent to the Board of Trade drawing their attention to the handicaps imposed on architects by the continued restrictions both as regards quality and quantity in the range of drawing-office materials, such as paper, linen, pencils and ink.

The Board of Trade replied on February 21 that reports had been received about the uneven quality of pencil leads and had been referred to the pencil industry, who denied there was any substance in the complaints as far as production as a whole is concerned. The Board of Trade, however, asked the R.I.B.A. if they could back the general complaint with more specific proof. The Council at their meeting on March 8, after considering this reply, decided that evidence in the form of samples of defective materials was needed; steps are being taken to assemble that evidence for submission to the Board of Trade.

I can assure readers that the R.I.B.A. will continue to do its utmost to obtain satisfaction in a matter which is of vital importance to the architectural profession.

C. D. SPRAGG,
Secretary, Royal Institute of British Architects.

66, Portland-place, W.1.

Housing: Economies in Plumbing.

TO THE EDITOR OF *The Builder*.

SIR,—In *The Builder* for March 4 you quote a Midland builder as saying: "the reduction of 1 in. to ¾ in. diameter pipe for circulators recommended by the Ministry of Works is a reduction in standard that even a 'jerry' builder would not consider." Against this point of view it can be said that the reduction in size will give increased temperature in the flow to cylinder, thus enabling some hot water to be obtained quicker than with the 1 in. circulation.

Believing that definite economies should be carefully considered, especially if better overall results can be claimed, I would like to suggest the following economies in the plumber and hot water services:—

A satisfactory heater unit fixed in a solid fuel fire, either in the sitting-room or kitchen;

One-inch maximum size piping for cold and hot water service, and that size only used for the short cold feed from cistern to cylinder. The pipe should be light gauge copper where protection against corrosive or hard water is required;

Direct instead of indirect heating for hot water supply;

Twenty-five gallons as maximum hot water storage;

Forty gallons as maximum cold water storage;

Omit non-conducting composition to cylinder, etc.;

Taper bath with pillar cocks in lieu of parallel enclosed bath;

Omit overflows for kitchen sink and bath, except in flats;

Single-pipe plumbing drainage for bath, lavatory basin and w.c., and sink waste to outside gully.

R. HASLAM.

2, Coniston-road,
Coulsdon.

Plastering Methods in America.

TO THE EDITOR OF *The Builder*.

SIR,—I was very pleasantly surprised at the large number of letters and telephone calls I received from practical plasterers and architects regarding my letter in your issue of February 18. I have replied to several but have been unable to answer all queries. I should be obliged if those to whom I did not reply would accept this letter as an apology and an explanation.

I am compiling a few notes; these I shall have "vetted" by my American friends and then, if required, they can be published in the form of a letter. I feel, however, that accuracy is essential at this stage so would respectfully correct certain statements made in Mr. R. P. Bannister's letter in your issue of March 4 in reply to mine.

(1) "Zonolite" is the same as "Vermiculite" (exfoliated);

(2) "Dantore" is a trade name covering several building products;

(3) Light-weight aggregates would not lessen the number of labourers required but would attract other building labourers to plastering because of the ease of work;

(4) "Dollar shortage" does not affect the issue as sources of supplies of aggregate are found within the Empire—also in the British Isles;

(5) All plastering tools are not "available in abundance" in America. There is a grave shortage of plastering "small tools" which can only be obtained from England. Apparently the art of making such tools is not known in America;

(6) All light-weight aggregates are not available at competitive prices "in bounteous measure" in the U.S.A. High transport costs localise a particular aggregate. Thus "Perlite" is used principally on the West Coast.

There is just one fact I should like to bring to the notice of all architects: one-coat work either on plaster board or walls is prohibited in the U.S.A. I append Rule 26 from the official "Working Rules of the Plasterers' Union."

"Under *no consideration* will one-coat work be permitted on interior work. Any member known to infringe on the above will on conviction be fined ten dollars for the first offence."

Incidentally, Master Plasterers would be expelled from their Association and fined heavily if convicted of the foregoing *offence*. I shudder to think what the penalties would be for an architect specifying one-coat work!

M. J. GRANT.

Manor House,
Gunnersbury-drive, W.5.

STEEL FOR THE CITY

THE Court of Common Council was informed on March 10 by Mr. C. Ernest Link that the City of London has been allotted one-third of the amount of steel to be allowed for the reconstruction of the bombed cities of the country.

The Improvement and Town Planning Committee reported that from July 1, 1948, to January 31, 1949, 110 planning applications had been granted and 23 refused. The cost of the 110 approved was estimated at £927,000. In addition, cost of development, excluding site values, for which planning permission was granted before July 1, 1948, was £4,597,000, making a total prospective expenditure of £5,524,000. Actual work could not be carried out until building licences had been granted by the Ministry of Works. Work had been begun on schemes costing about £925,000 and licences had been granted for further schemes costing about £1,523,000.

IN PARLIAMENT

Loans for Small Dwellings.

MR. AWBERY asked the Minister of Health if he would, in view of the increased cost of building, increase the limit permitted to a local authority to loan under the Small Dwellings Acquisition Act to enable a larger number of people to acquire their homes by this method.

MR. BLENKINSOP said that this was under consideration in connection with the new Housing Bill.

Housing for Aged People.

MR. MARTIN LINDSAY asked the Minister of Health whether he was satisfied that local authorities' building programmes include sufficient provision of one-bedroom dwellings for old people.

MR. BEVAN said that this matter was under consideration by his Central Housing Advisory Committee.

Capital Expenditure.

MR. HALE asked the Minister of Health what would be the effect of the proposals for capital expenditure contained in the United Kingdom's plans submitted to the Organisation for European Economic Recovery on the housing programme for 1949.

MR. BEVAN.—None, sir.

Housing in London.

MR. BESWICK asked the Minister of Health if he was aware that individuals granted a private building licence were now finding it impossible, in the Greater London area, to get a house built for £1,500; what steps he was taking to get down the cost of building; and if he would increase the maximum amount allowable under the Small Dwellings Acquisition Act.

MR. BEVAN said there was no such licensing limit of £1,500. The Girdwood Committee was considering the question of housing costs. By Clause 35 of the Housing Bill now before Parliament the limit on the market value of a house in respect of which an advance might be made under the Small Dwellings Acquisition Acts was increased from £1,500 to £5,000.

Materials.

SIR WALDRON SMITHERS asked the Minister of Health in view of the fact that there was no hold up in housing work for the lack of bricks, cement, timber and steel, why timber was restricted to 1.6 standards per house, why there was nine months' delay in delivery of steel rods, why local authorities had recently been asked to use substitutes for lead, and why permission had been refused to construct concrete roads, with the result that they were being made of hard core and macadam at extra cost.

MR. BEVAN said that the use of certain materials was limited precisely in order that housing work should not be held up.

One to Four Ratio.

MR. HURD asked the Minister of Health if he was satisfied that, on his instructions, all local authorities without exception had applied the ratio of one to four in granting licences for house building by private enterprise in proportion to the houses built by local authorities.

MR. BEVAN said that discretion had been given to local authorities to decide whether they would issue any licences for the building of houses by private persons and, if so, what licences they would issue within the maximum of one-fifth of the number of houses allocated to them for building.

THE ARCHITECT IN INDUSTRY

CONFERENCE AT THE R.I.B.A.

THE first session of the two-day conference on "The Architect in Industry" opened at the Royal Institute of British Architects, London, on March 3. The subject for this first session was "Large and Small Scale Industry under Private Enterprise," and SIR PERCY THOMAS, O.B.E., P-P.R.I.B.A., M.T.P.I., who presided, said it was fortunate that industrial leaders were turning to architects for help, and were finding what a great service the architect could render them. Most factories in the past had grown in a haphazard manner, but the greater complexity of modern industry and the new methods of construction called for the services of a team of experts. Because of his training and experience, the architect was the natural leader of that team. It was essential that new factories should have the services of such a team, and that demanded the closest co-operation between the architect, the structural engineer, the mechanical engineer, experts on heating, ventilating and lighting, and the quantity surveyor.

The Royal Institute would have to consider the question of fees on very big projects, and the position of the architect who was called in as consultant. Many industrial concerns had their own architectural staff, but for some projects the directors felt the need to call in an independent consultant. That gave opportunities to younger architects to undertake great tasks with the assistance of this permanent staff, which they could not carry out without such assistance; they could not suddenly create a staff to do the work.

SESSION 1.—INDUSTRY UNDER PRIVATE ENTERPRISE

On this subject MR. ANTHONY M. CHITTY, F.R.I.B.A., A.M.T.P.I., said that the relative value of the factory shelter and the factory plant, combined with the flexibility and generous scale of the financial arrangements possible with factory buildings (e.g., industrial derating, depreciation allowances, short-term replacement possibilities), opened up a range of exceptional opportunities for keeping abreast of the latest developments in planning, construction and economic administration which was too little exploited. Too many of our industries were housed in premises which were both barbarously obsolete and cruelly uneconomic to maintain.

Nowhere was the need for reform of the factory so great as in its general "atmospheric" character. Here the Scandinavians and Swiss were greatly in advance of ourselves and the Americans. Perhaps the most important requirement was the reintroduction of the human scale. The individual working on the interior floor spaces of a great factory, out of sight of sun, sky and vegetation, acquired an unbalanced viewpoint, and when a hundred workers shared that unbalance their work would suffer and discontent prevail. Factory space should be broken down into smaller units and interspersed with grass, trees and flower-beds. Many industries were capable of division into separate units, and additional elbow-room between the linked parts might increase efficiency.

LORD FORRESTER, M.A., said that industry should give up the facile process of thinking which allowed it to imagine that a factory was a box or a shell or an envelope or a machine for working in. A factory was basically a place where valuable raw materials were converted into finished products of greater value by the application of labour of hand and mind and the working of machines; and the finished products must, under private enterprise, be saleable at competitive prices.

The building itself was one of the major sources of profit or loss in that operation of conversion. It had to be written off, perhaps, over 60 years; it had to be maintained; and its structure and layout affected basically the annual cost of maintenance.

Designing Industrial Buildings.

After a ten-minute interval, two further papers were presented, one by Mr. C. S. White and one by Mr. Paul Cadbury. The chairman said that Mr. White was unfortunately ill, and his paper would be read in his absence by Mr. Eric Bird, M.C., A.R.I.B.A.

MR. C. S. WHITE, F.R.I.B.A., wrote that there were three ways in which an architect could contribute to industrial building: (i) by providing buildings of a given floor area, but without regard to the specific process to be accommodated; (ii) by providing buildings to suit a layout of plant for which process plans had been prepared in advance by the client's staff; and (iii) by collaboration with the client from the beginning, which involved studying existing processes, if they existed, and determining faults, and then devising new process plans and determining routing for all departments without regard to buildings as such; and lastly, providing buildings to house a well-studied process. After some experience of all three methods, he had found the last to be the most satisfactory.

Some headings under which process planning should commonly be considered were: (a) The logical sequence of departments; (b) direct flow; (c) manual and mechanical handling (carrying, trucking, conveyors, etc.); (d) provision of adequate gangways; (e) space for buffer stocks between departments (essential where some were on a seven-day week basis and some on a five-day basis); (f) provision for future extension of certain departments without disturbing the main flow line, which was sometimes difficult.

When designing the actual buildings, attention must be given to: (1) The degree of permanence desired by the client. Here economy in first cost had to be balanced against the cost of maintenance; (2) provision for extension, and sometimes the need to build in stages; (3) whether a single-storey or multi-storey layout was appropriate for part or all of the process; (4) loads, both imposed on floors and suspended from above; (5) provision of voids in floors and roofs for services and equipment. This was most important; (6) the nature and intensity of daylighting; (7) the services. These were tending to become more and more complex, and might well include heating, hot water supply, ventilation, electricity (possibly a.c. and d.c., and more than one voltage), gas, compressed air, steam, sprinklers and special fire-extinguishing appliances, telephones (Post Office and internal), call signs, lifts and hoists, conveyors and pneumatic tubes, process and other drainage, and dust extraction. Accessibility and identification of all services were very important; (8) the type of structure, its roofing, floor finishes, colours, etc.; (9) cloakrooms, washing rooms and lavatories; (10) the ancillary buildings common to almost all factories—the office block, canteen, welfare unit, gatehouse, and maintenance block; (11) roads and parks for lorries, cars and cycles.

Time was well spent on thorough study and research at the beginning. To rush into a building enterprise with inadequate preparation always involved costly alteration, delay, and unsatisfactory results.

MR. PAUL CADBURY, C.B.E., said that in designing buildings to house industry, the main need was for them to be satisfactory from an economic point of view, the ultimate issue being the cost of production, on which depended the ability of our industry to compete in the markets of the world. If even sheltered industries were extravagantly housed, the cost of production would reflect itself in other industries.

Distribution was important. About one-third of the total cost of all consumer goods was represented by the cost of distribution, and no small part of this was the cost of shops and warehouses.

SESSION 2.—NATIONALISED INDUSTRIES

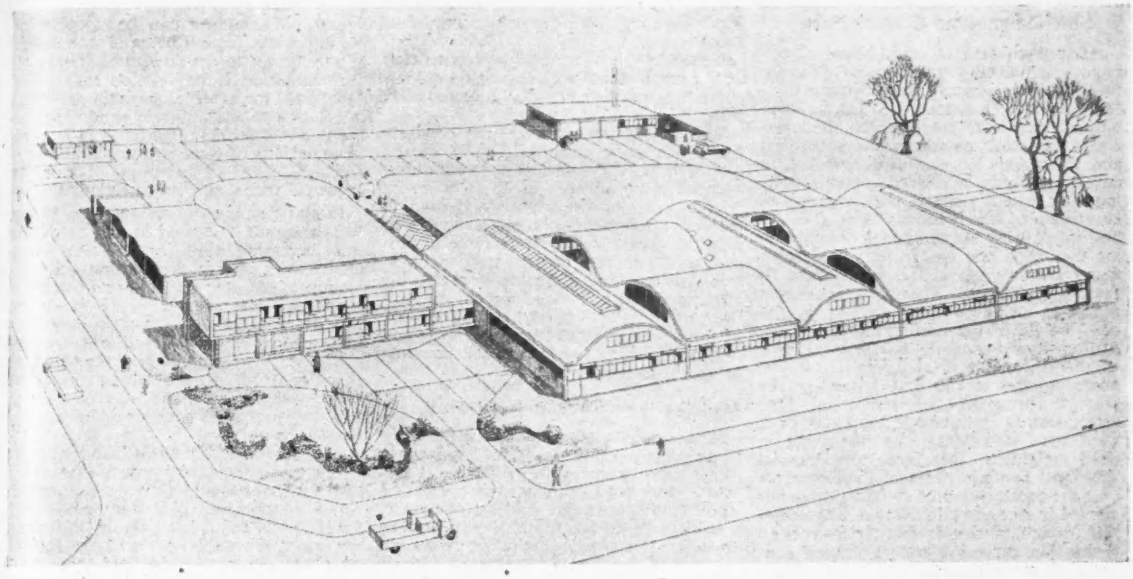
LORD CITRINE, chairman of the British Electricity Authority, presided at the second session, at which "Nationalised Industries" was the subject under discussion.

SIR JOHN HACKING, M.I.E.E., Deputy-Chairman (Operation), British Electricity Authority, said that 49 per cent. of the total energy generated was used for industrial purposes, and in view of the high rate of employment in this country and the need for increased productivity per worker, there was a strong case for the further mechanisation of industry, which would involve correspondingly increased supplies of electricity. The B.E.A. were at present carrying out a survey throughout the country to find possible sites for future stations. While it must be admitted that in the past many stations had been built purely from a utility point of view, and had had no architectural merit, it was the Authority's intention that the design of all new stations should be entrusted to competent architects.

MR. KENNETH CAMPBELL, A.R.I.B.A., of the Architects' Department, National Coal Board, said that the architect in nationalised industry was an animal which hardly existed, and the function of the architect in nationalised industry was something which was now being slowly and painfully brought to birth. The word "painfully" in that connection was not a cliché but an exact description.

Nationalised industry gave an opportunity for the co-ordination of design and planning and for bringing inside one scope the whole of development. Unless we grasped that responsibility very soon, and understood the need to cope with this planning on a wide basis, we should run into considerable trouble in the not distant future.

Whatever form the organisation of the architectural services of a nationalised industry, or any other industry, might take, there would still be serious problems to solve. Just as nationalised industry had yet to solve the problem of combining public ownership with the necessary authority of the managing body, and both were essential, so in design it was necessary to solve the problem of expressing an undertaking which was the property of



A CARD BOX FACTORY, DAGENHAM DOCK. F. R. S. Yorke, E. Rosenberg and C. S. Mardall, Architects.

the people as a whole and which should express their aspirations and feelings, and at the same time retaining the initiative of the individual designer.

That was a problem which architects and architecture had hardly yet begun to face, but he felt that in nationalised industry it might be possible to find the way to a solution. The problem extended beyond nationalised industry to architecture as a whole.

Mr. Campbell concluded by saying that he believed that an integrated department, properly organised, could show as much if not more initiative than the individual consultant, because, knowing its colleagues and the problems of the industry, it could exercise more initiative than the individual consultant who was faced with the problem anew, having come in from quite other fields.

SESSION 3.—TECHNICAL GROUPS

(A) STRUCTURAL TECHNIQUES

MR. W. S. ATKINS, B.Sc., A.M.I.C.E., who opened the discussion on "Structural Techniques," devoted a large part of his remarks to the design of single-storey buildings, and said:—The single-storey building is possibly the commonest of the industrial buildings, and can be sub-divided into two classes: (i) the plain industrial building which does not carry overhead cranes, the simplest type of all, and (ii) the industrial building carrying heavy or light overhead electric cranes. The design basis of these two types is quite distinct.

For the more simple buildings we have the ordinary pitched roof, the flat roof or the north-light outline. With the pitched roof, the open portal frame is gaining popularity. I have heard in many quarters that you cannot do an open portal frame for the same price as an ordinary roof truss, but I do not think that this is true. It depends a great deal on the skill of the designer and whether he knows how far he can go with a complicated design and understands what happens in a redundant framework. It may be that on very small spans the light, bolted truss is still the cheapest job, but I do not think that that is so on the usual industrial spans.

In the single-storey building without cranes, since we are dealing with buildings which have no racking or lateral forces, there is probably nothing between the two types with regard to life, and it does not matter whether you use an open portal frame or a roof truss job, but the open portal frame is very much cheaper to maintain than the roof truss job; painting is very much cheaper on a job where most of the steelwork is gathered together and larger sections are used.

Where headroom is decided solely for the benefit of the occupants it is possible to reduce the eaves level of the building, using the open frame, and still provide an impression of greater ceiling height than is possible with the use of roof trusses, where you have the false impression of a ceiling level.

In the case of the north-light type of roof the conventional outline is very familiar to us, particularly in the standard factories which have been built up and down the country by various Ministries. There we have the usual untidy mass of roof framework cluttering the whole of the roof space in many cases, but it is possible to have north-light construction with all the framing confined to the slope of the rafters. The girders are laid in the rafter level both for the north slopes and the south slopes, and there is no steelwork inside the building except in one longitudinally braced bay. This is an easy solution for big spans without having a multiplicity of framing, and it is clean and light. The main members of each truss frame, which lie in the rafter plane, are jointed with a rigid joint at the top and at the bottom, so that up and down the slope you get a continuous framework. That is a very light type of structure and rather flimsy to erect, but once it is up it is probably stronger than the conventional type.

There is not much to be said about the flat roof, single-storey industrial structure except that when the building houses cranes the continuous framework has a marked superiority over the more simple design, because it gives greater rigidity of structure and ability to maintain crane track lines.

Use of High-Tensile Steel.

In the other single-storey buildings which we have just discussed some advantage may be found from the point of view of economy by the use of high-tensile steel, particularly in a welded frame, but for buildings which have to withstand considerable longitudinal and lateral forces, as when housing cranes, the advantage of the use of high-tensile steel may not be obtained. In a properly designed building of this type, using a continuous crane and continuous crane girders, which is the ultimate ideal for this type of structure, consideration must be given to the inertia of the framework in relation to its ability to absorb the energy of the forces imposed on it. In buildings subject to continuous abuse in the working process, such as foundries, heavy machine shops, etc., careful attention must be given to the mass inertia of the members and of the building as a whole, or the building and crane tracks will be an endless source of trouble.

We can have buildings with cranes using the simple roof truss and cantilever stanchions, and also an open portal frame carrying crane tracks. Then we have the modern all-welded frame building with crane tracks using a flat roof with a high-low outline. In this case the rigid frames rise out of fixed bases with different inertias right round the structure. The main frames are spaced 40 ft. apart and the purlins are ordinary plain joists cantilevered over with slings down at each end which pick up the low-level roof.

In reinforced concrete single-storey buildings little has been done by the *in situ* method mainly because it was so costly, but with precasting a number of methods have come into being since 1939. The very simple type of Ministry of Works hut is familiar, but this is limited to small-span jobs. Some of the later developments in the use of precast reinforced concrete framework in single-storey buildings are interesting, and use both the ordinary pitched roof and the north-light roof. Probably more is being done on sound engineering lines with this type of construction in this country than anywhere else in the world.

Shell Membrane Construction.

After describing in detail some of the factors influencing the choice of structural technique in factory construction, MR. EDWARD D. MILLS, F.R.I.B.A., went on to describe at some length the principles of shell membrane construction, and said: One of the most outstanding developments in reinforced concrete technique of recent years is shell membrane construction, which allows large areas to be roofed using the minimum of supporting members, and has in its varied form many features of interest in relation to factory buildings. One of the major problems of large span roofing is the dead weight of the roofing material used, and reinforced concrete in its normal form is, therefore, not ideal. Shell concrete, however, uses to the best advantage the strength properties of reinforced concrete, and as the average thickness of a shell roof is only 2½ in., the saving in dead weight is, therefore, considerable. The most common form of shell concrete is in the construction of cylindrical barrels curved in one direction only. The essential feature of this form of construction is the thin curved *in situ* reinforced concrete membrane, held to a cylindrical shape by comparatively rigid stiffening beams at suitable intervals. The relation between the intervals of the stiffening beams and the chord width of the barrel can vary over a wide range, and is used to define the type of barrel. At one extreme is the cross barrel, where the stiffening beam interval may be as much as four times the chord width, and at the other—the longitudinal barrel—where the stiffening beam interval may be as small as half or less of the chord width. Generally speaking, cross-barrels are used for smaller spans up to 100 ft., while longitudinal barrels are used for spans from 100 ft. up to as much as 250 ft. With the larger spans the stiffening beam becomes an arch rib with the shell membrane spanning between the ribs at 30 to 50 ft. intervals. One of the chief economic advantages of shell concrete construction is the very considerable saving in the weight of steel used; in general about 50 per cent. of the steel required for normal construction is used in a barrel vault roof of similar area and layout. Any type of building where a large open space, free from supporting columns, is required forms a suitable subject for shell concrete construction, and where a series of standard bays are required for warehouses, stores, etc., a number of runs of small span cross-barrels can be used to cover any area.

Roof lighting can be easily arranged in the shell structure by a variety of means, including glass domes, continuous lanterns, or glass lenses over the whole barrel. Natural light can also be obtained from windows in the walls of the building or through the end stiffening beams. The even curve of the barrel reflects the light, and better and more even daylighting can be obtained with smaller areas of roof glazing than are required in a normal type of structure. The curve of the roof also assists artificial lighting by providing a natural reflective surface. In future factory construction the shell concrete north-light roof has much to commend it apart from its improved appearance over the more traditional steel north-light roof. The shell north-light roof gives a very high percentage of natural light, and has the outstanding advantage of a smooth, unbroken ceiling surface providing no lodgment for dust. This latter point is one of considerable importance, particularly in packing shops and similar buildings where dust is a constant enemy and a costly one.

Concrete shells can also be constructed in the form of domes or in using a shell curved in two directions on a rectangular plan.

The possibility of precasting concrete shells has been considered, and during the war precast cylindrical concrete shells, each covering an area of 16 ft. 6 in. by 33 ft., were mass-produced and used in the construction of a large steelworks in Upper Silesia. So far no example of precast shell concrete construction exists in this country, but there are considerable advantages in the development of this form of construction, particularly in view of the shortage of shuttering timber, and it is hoped that experiments will be made in the near future.

Cladding the Structural Framework.

The cladding of buildings or the technique of covering a structural framework, either steel or concrete, where walls and roofs are used simply as protection against rain, heat and cold, is, of course, a subject in itself. It must, however, be considered in any discussion on structural techniques for factory buildings. While many industrial buildings will require concrete, brick or other form of solid walling, thin composite skins can often be used, built up of a weather-resisting external surface, an inner wearing surface and a core of thermal and sound insulating material. Where an industrial building may be subject to frequent extension or alteration, a building may be clad with light insulated panels or sheets of a wide variety. Where a building is regarded as semi-permanent, the structural framework can be designed for demounting, and with demountable light panel walling can be dismantled at any time and re-erected in another form on another site with 100 per cent. salvage value. To suggest a few possibilities for external weathering surfaces, the following could be used: light precast concrete units, asbestos cement sheets in a variety of sections, light alloy sheets, steel sheets, resin-bonded plywood and glass, either clear or opaque. These materials all have a high thermal conductivity value, and therefore to avoid high heat losses precautions must be taken in the form of adequate thermal insulation. There is a wide range of efficient insulation materials available, including compressed fibre-board, cork, wood-wool products, expanded rubber plastics, lightweight cellular concrete, glass fibre, and many more. Internal surfaces can be faced with plasterboard, highly compressed fibre-board, plywood, metal and glass. All these materials have their own special merits and are suitable in certain conditions. Lightweight cladding of this type for walls, roofs and even internal partitions can be factory-made in unit panel form and simply fixed to the structural framework on the site. The panels can be designed for removal and reuse, and can incorporate door and window openings. Semi-permanent buildings designed in this manner are more attractive in appearance than a collection of ill-adapted blister hangars or ex-Army huts, and have a longer and more satisfactory life. Lightweight cladding has been used for many years on industrial buildings in the form of corrugated iron and asbestos cement sheeting for walls and roofs, but with so little imagination and so little real understanding of its possibilities for architectural treatment that it is now often unreasonably condemned.

When a factory is designed with non-load-bearing walls, properly designed lightweight cladding can be considered; the important factors being (1) the design of the fixings to the structural frame; (2) the weathering at the junction of sheets or panels; (3) the external surfacing material in relation to atmospheric conditions; (4) the internal surfacing material in relation to conditions of wear within the building; and (5) the all-important factor of adequate sound and heat insulation.

In the ensuing discussion, MR. W. A. JOHNSON said it seemed to him that there was increasing need for attention to be paid to the surface preparation and protection of structural mild steels for many purposes, particularly where steelwork was not encased and subject to corrosive atmospheres externally and where corrosive gases were generated in the building. In other words, wire brushing of steel as rolled was not adequate as a base on to which any effective paint or other material should be put.

MR. W. S. ATKINS agreed, and said that it was really the initial preparation of the steel for the anti-corrosion measures which was all-important. If it were possible to get proper steel with a coating on it from the mills it would be very nice for the structural engineer. The final coating did not matter very much if the preparation was right; the only difference would be in the maintenance life of the subsequent coatings.

(B) HEATING AND VENTILATING

MR. E. D. J. MATHEWS presided over the Technical Group on Heating and Ventilating.

DR. THOMAS BEDFORD, B.Sc., Ph.D., M.I.Min.E., the first speaker, began by saying that the atmospheric conditions of his work place had a profound effect not only on the comfort of the industrial worker but also on his general well-being, his efficiency and his liability to incur accidents and to suffer sickness. He continued:—

I would say that in a satisfactory system of heating and ventilation the temperature should be as low as is compatible with comfort; there should be adequate and variable air movement without local draught (typically in the winter months 20-40 ft. per minute and a somewhat higher rate in warm weather), and the humidity should be low, certainly not above 70 per cent. Incidentally, I may say that I know of no reason why humidities as low as 30 per cent. should not be used if that is felt to be desirable; I know of no discomfort arising from them, whatever other practical considerations there may be against them. The temperature of the radiating surroundings should be higher than the temperature of the air, and the air at head level should not be substantially higher in temperature than the air at floor level, nor should there be excessive radiation at head level.

These matters have their implications in the question of practical working or design. One is the question of temperature control. In a good many years' experience of factory investigations, I have found that a factory is often not quite warm enough when the workers start work in the morning. If automatic temperature control is not installed, there should be proper supervision by some person who is made responsible for looking after the temperature.

The question of air movement is a very important one, and in any mechanical system of ventilation great care should be taken in the design and proper placing of air inlets, so that draughts

will not develop but a reasonable amount of turbulent air movement will be set up.

If air-heating methods are to be relied upon, it is important that the air sent into the building should be at as low a temperature as is practicable. If one has a certain number of British thermal units to deliver, they should be delivered in a large volume of relatively cool air rather than in a small volume of very hot air, so that there will be more likelihood of avoiding steep temperature gradients.

Overhead unit heaters should be used with discretion. I have no doubt that when they are properly installed and properly used they can be a very useful means of heating, but I have had a rather unpleasant experience in some factories where, walking along the factory floor, I have suddenly been hit by a searing blast of hot air. It just happened that I was in the line of fire, and a few feet away the hot air had zoomed up into the air spaces again, but there must have been very considerable waste and very considerable discomfort to a large number of people.

Ventilation in Factories

Dealing more particularly with ventilation so far as it is required generally, MR. L. COPELAND WATTS, M.I.Mech.E., A.C.G.I., M.I.H.V.E., said:—

The Factories Act does not lay down specific regulations but requires only that "effective and suitable provision shall be made for securing and maintaining by the circulation of fresh air in each workroom the adequate ventilation of the room." That leaves the matter very much open to the heating engineer. The amount of air required depends to a large extent upon the concentration of population. In a factory occupied to the legal limit more air must be moved through the working zone than will be necessary in the case of one more sparsely occupied. Satisfactory conditions depend not only on an adequate supply of air but also on a reasonable degree of air movement. Even distribution over the whole working space is important, and this cannot always be obtained by natural means. In the case of a large floor area, with windows on one or two sides only, natural ventilation may not be satisfactory, since the cold air entering through the windows in sufficient quantity to give reasonable conditions in the centre or the far side of the room may cause discomfort to the people working near the windows. In the case of installations employing unit heaters which are connected to the outside air, air distribution and consequently ventilation can easily be controlled so as to meet the requirements satisfactorily. This system has the advantage that the entering air is warmed in winter and, if the units are used in summer without the air being heated, the air movement can be arranged to give reasonable conditions in the working zone.

Where the unit heaters are not arranged to supply fresh air from outside and in the case of multi-storey buildings where radiators are employed for heating, it may be found necessary to distribute air by means of mechanical ventilation employing fan and ducts. This can often be done quite economically by running the minimum of trunking, employing nozzles to discharge the air above working level at a fairly high velocity which induces a turbulence and change of air at the working level.

In some cases specially designed ventilators are employed, arranged to exhaust air from the building by the suction effect of the wind and fixed in the roofs of the single-storey buildings. These can be quite efficient, but the disadvantage of a large volume of cold air entering through the windows may cause difficulties in winter. If this type of ventilator is employed, it is essential that dampers are provided, so that some or all of the ventilators can be closed. This is particularly desirable at night, when the building is unoccupied, as it will cool down much more rapidly if the ventilators are left open than if the dampers are closed.

In all cases where mechanical ventilation has to be employed it is advisable to provide direct heating surface to make good the heat losses from the structure, so that the air can be introduced at little above room temperature. The air required for ventilation should be warmed by a suitable heater to 5 deg. F.-10 deg. F. above room temperature. In addition to warming the air, in most cases provision should also be made for cleaning it by means of filters.

Insulation of Factories

MR. A. G. SUTTON, M.A., who dealt with the subject of the insulation of factories, said that neither individually nor as a nation could we afford to burn two tons of fuel when one would do the job. The thermal insulation of buildings was therefore a matter of national importance as well as a matter of importance to individuals. Moreover, the provision of insulation would not necessarily increase the capital cost of a new building, the reason for that being that the cost of the insulation would be offset by the reduced size and cost of the heating plant. Therefore there was no case for leaving out insulation on account of reducing the initial capital cost.

Mr. Sutton went on: The thermal transmittance or U value of a single-sheeted corrugated asbestos cement roof is 1.4; that is the number of British thermal units which will pass through per sq. ft. per hour. The fuel used to make good the heat loss through 1,000 sq. ft. of the roof amounts to 7.8 tons per annum. If the same roof is lined with ½-in. fibre board, with an air space between the lining and the roof, the thermal transmittance or U value is reduced from 1.4 to 0.32, and there is a saving of 6 tons of fuel per annum for every 1,000 sq. ft. of roof structure. Clearly, then, on economic grounds there can be no case for omitting to insulate this type of building, particularly if it entails no increase in first cost.

Can anything be done to improve the existing buildings which have been erected without insulation? For this type of construction the answer is definitely Yes. Obviously it is easier and cheaper to insulate a building in its early stages, while it is being put up, than it is to add a layer of insulation afterwards, but, even so, the saving in fuel will generally pay for the cost of insulation within about three or four years. The actual cost will vary with the method of insulation, the size and the shape of the building, the location of the building and the height of the roof above the ground. A rough figure for ½-in. insulating board, suspended below the purlins, is 1s. 6d. per sq. ft., fixed complete, which is £75 per 1,000 sq. ft. The actual fuel saving will also depend on individual circumstances, such as the type of fuel and the overall efficiency of the heating system. On the basis of 6 tons per 1,000 sq. ft., the saving in four years would be 24 tons, which would have cost more than the insulation.

The basis on which these figures have been derived is given in Fuel Efficiency Bulletin No. 12, issued by the Ministry of Fuel and Power in 1942. These calculations may sound a little theoretical, but there has not been any juggling with figures to achieve these results, and the fact that they are achieved in practice has been recently demonstrated by the Northern Aluminium Company.

In conclusion, the speaker said that insulation had other advantages. These included the prevention of condensation and pattern staining, the elimination of down-draught from cold surfaces and, in certain cases, increased fire resistance and protection from the sun in summer. A building with an insulating lining warmed up quickly, and the absence of cold surrounding surfaces added greatly to the comfort of the occupants.

(C) NATURAL AND ARTIFICIAL LIGHTING

MR. R. O. ACKERLEY, F.I.E.S., and MR. W. A. ALLEN, B.Arch., A.R.I.B.A., were the principal speakers in the Technical Group on Natural and Artificial Lighting. MR. HOWARD V. LOBB, F.R.I.B.A., was in the chair.

Outlining some of the principal factors which had to be considered when planning a lighting installation, Mr. Ackerley said the job was divided into two parts, the general job, that is, the whole nature of the job, and then structural features, namely, whether there were things which would interfere with the light. In that connection, of course, the advance co-operation between the lighting engineer and the architect was of great importance, because sometimes by previous thought it was possible to avoid unnecessary obstructions. Then there was the question of decoration, the extent to which walls and so on would throw back light which was thrown on them. Next came what he called "personnel." It involved the question of whether, for instance, you were working with rather old people or young people, because old people unquestionably needed more light. Then there was the question of whether men or women were working on a particular job, because that affected the choice between high-pressure mercury lamps, tungsten or fluorescent lamps. For instance, in a foundry, as a general rule as soon as the men get used to it, they like working in the very good visibility provided by high-pressure mercury lamps; but if the same light was applied in a shop where only women were employed on, say, assembly work, the fact that it would make their make-up go to blazes would cause them to dislike it. Also there was the question of whether skilled or unskilled labour was being employed, because unskilled labour generally required more light than skilled. The reason was, of course, that untrained labour did their work by sight whereas the really experienced man very largely did his work by sense of touch.

The next consideration was the actual work which the man was going to do, which led to the subject of "task analysis." It was necessary to find out what it was the man wanted to see, how he saw it, and so forth, and in many cases nobody other than the expert in the job knew what it was he wanted to see. In floor inspection processes, the layman carrying out the job had no idea what it was the inspector was looking for, but the lighting engineer had to prescribe for that job. He must know the physical factor of the job, that is, the texture of the finish and colour, which might or might not be important, except in so far as it affected illumination values, and what had been

called elevation; in other words, whether the job was on the horizontal plane or tilted. Then finally there was what was called the operative process which affected everything which went on around; the movement of the man, the movement of his neighbours, and the obstruction which he might get from objects around him, etc.

Having decided on the method of lighting it was necessary to decide on the choice of fitting and on light distribution, whether it should be totally indirect lighting fitting or semi-indirect. In general, I do not think that totally indirect could be recommended in industrial work except in special cases, such as control rooms. Broadly speaking, totally indirect lighting was liable to be rather monotonous in industrial work, and liable to make the ceiling brighter than the work instead of trying to arrange things generally so that the work was at least as bright as most things in the neighbourhood. Probably the best distribution apart from special requirements of concentrated angle light was to get a reasonable amount of light up to the walls and ceilings, perhaps 20 per cent., and the rest concentrated down fairly directly on to the work.

Natural Lighting

Dealing with the subject of natural lighting, MR. W. ALLEN (of the Building Research Station) mentioned the common north-light roof, the double-pitch roof, and what was called the "monitor" type of roof in which panels of glazing were set up. The speaker continued: Comparing these three main types of roof, one can arrive at some general trend of good practice, and some more accurate basis of criticism, recognising that we have a fair distance to go yet before experience and scientific work carries us to the stage which is necessary for accurate prediction of desirable results, and recognising also that the requirements of future industries as regards natural light have not been classified in any way except from the point of view of the admittance or exclusion of sunlight.

Of the three types of roof, the double-pitch roof admits most light for the area of glass used; the north light comes next, and the monitor type is third—so far as the amount of light is concerned. There are, of course, other very important factors to be taken into account, one of which is the direction of daylight, and in this connection the Americans have recorded their experience quite explicitly. They say that with the north-light roof, giving light mainly in one direction, you have a very constraining system, in so far as you may not light both sides of the object upon which you are working. This results, if you are using a production line, in the necessity of having a production line going in one direction, that is, across the line of the roof light in order to get some light both sides.

If you run parallel to the roof lights you find that one side is light and one side is not. That, of course, is a serious disadvantage, and that was the main incentive so far as the Americans were concerned to use monitor lighting. I think it is fair to say that light from two sides or two directions is probably essential for production line layout, and it is probably very useful for a great many other problems which are not concerned with production lines.

It is perhaps the case that the double-pitch roof with glass panels on each side might serve the purpose of two directional lighting as well as the monitor, but one may find that the shadows downward are so severe that the undersides of objects get too dimly lit. That may be one of the disadvantages which has caused it to be unpopular in the United States for production lines.

With regard to sunlight, it is perfectly clear when comparing the different roof systems that those with glass on two sides have no chance of excluding sunlight, and that those with north light can do so without any difficulty. We do not know how much importance to attach to this point. There are some industries where sunlight cannot be admitted. High precision work can, for instance, be affected by sunlight. There are other cases where, as, for instance, in the cotton industry, they rely to some extent on very primitive systems of air conditioning which serve their purpose well enough, but which would find sunlight troublesome in the way in which it changed temperatures and thus humidities.

For the rest, the argument which is advanced against sunlight is that sharp beams and shafts of light falling across a factory have considerable irritation effect in the way they light up work. It is commonly called glare, but it is a mixed-up business of glare and bad shadowing. It is something on which we want a great deal more information. I do not see why the use of distorting glass on the south side should not diffuse the beams sufficiently to make this question of sharp shadowing and disfiguring rather unimportant, but it would depend upon using the correct glass. One would like to diffuse the beam without getting the glass bright. I do not know of any case where I have seen that used deliberately, but I think it is something which bears looking into. We should welcome any information which can be sent to us on the question of sunlight in factories, because it may be critical in developing the shape of a roof.

So far as the quantity of light is concerned, the monitor roof comes off the worst; but in all other respects, with the exception of sunlight, I think it comes off the best. If the sunlight problem can be put on one side for a moment as being a critical factor, then I think one has to look very carefully at the arguments for monitor lighting to see whether they are not going to guide us towards the use of that lighting in our factories.

I think that the area of glass, although it reflects heat losses, should not be regarded as important when the other factors are taken into consideration. I should say that if one could increase the glass area and increase its efficiency by slightly sloping it, one could probably get up to amounts of light which were generally acceptable for ordinary factory work. Under those conditions it seems certain that monitor lighting would show advantages in respect of freedom from glare, easy cleaning, convenience of layout of the factory beneath, and the kind of light desirable on the product being worked on.

The Americans point to two other factors, the important one of which is that natural ventilation with monitor lighting is easier to arrange than with any other form of roof lighting. They make that assertion forcefully and with great experience, and I think it should be accepted.

(D) VARIOUS FACTORS AFFECTING WORKING CONDITIONS

A STRONG plea for thorough liaison and co-operation at an early date between the industrial client and the architect was made by MR. H. G. MAULE in the course of a paper read before the Technical Group on Various Factors Affecting Working Conditions. MR. CECIL C. HANDISYDE was in the chair. Following are extracts from Mr. Maule's remarks:—

The regulations demand the segregation of certain workers from other work; certain processes in accumulator manufacture should not take place except in separate rooms, women are prohibited from working in rooms in which certain other processes take place, young people are forbidden to work on certain jobs in industry. If the client does not give the full facts of what his processes are and what these imply, the architect can well fail to put the necessary partition walls to separate the different parts of the process one from the other.

Although this separation of different processes and different shops is sometimes legally necessary, it is always psychologically necessary too. I see a conflict between the industrial planner and the needs of the industrial worker. The industrial planner, I think, likes to have wide open spaces with as few girders as he can, with as few partition walls. What the workers like, as a rule, is the small intimate workroom. I think that the architect and the client have got to get together and discuss this problem of size of rooms both in relation to the needs of processes, the needs of production, and the psychological needs of the work-people. I do not believe anyone can give the right answer as to what is the right size, it depends upon so many factors; but at least one can think about the problem instead of going blindly into these huge halls of industry in which several hundred people are working under one roof with no distinction between one department and another.

On the subject of the medical department and the personnel department in a factory, the speaker said: The architect must make it his job to know what the doctor wants. Is there going to be an X-ray plant? He must know that the doctor wants six metres length in order to do his eye tests. He must know whether there are men and women on the staff in the works. He must provide separate accommodation for waiting in the first-aid department. He must provide the lavatory and washing facilities for the medical staff and for the nurse. Very often the nurse has nowhere to wash her hands or she has no lavatory; she has got to go out to the general lavatories. It is often forgotten. The nurse often has to keep records but seldom has she got an office in which to keep them. She has got to do a lot of office work but she has not got accommodation for her files. These things happen, and I say they happen because the architect and the industrialist have not got together and have not exchanged their views and their data. The architect must know something of the problems of every single range of employee, from the managing director down to the charge hand. Many charge hands have to keep records of some sort, and you see them squatting on an upturned orange box, it is now something else, writing with a blunt pencil on their knees; they have no table, no room to work in. A little bit up the hierarchy they have one of these glass boxes, the foreman's box. Here they can do the written work they have to do, but they probably have got no washbasin, no towel, no heating, and probably inadequate lighting because the box has just been shoved there and it was not thought of when the plant was on the drawing board.

But if we are to avoid these mistakes,

there are several people who have got to be asked, and one of the people is the man at the bench himself. It is surprising what a lot of sound common sense there is on the factory floor, and its point of view is frequently not obtained by the management because they do not ask.

The Size of Working Groups

The view that the jobs of the industrial psychologist and of the industrial architect were not so widely separated as might at first appear, was expressed by DR. C. X. DAVIS, of the Industrial Health Research Board of the Medical Research Council.

There was, he said, one point on which he thought the findings of the industrial psychologist were particularly relevant to the architect. It was a point which had been mentioned by Mr. Maule regarding the size of the working group.

Dr. Davis continued: Quite a lot of work has been done on that recently, and all the findings seem to indicate that a relatively small group of workers is both happier and more efficient. If that is so, it is obviously going to affect the design of the factory. More immediately relevant is the question of the size of the whole factory, not only the different departments within it. I think a very large and highly centralised organisation, whatever its advantages, does tend to weaken the ties that bind the individual to the whole. It is not easy to weld a large organisation or a large working group into a social integrated unit, but since modern developments make large-scale organisations often inevitable, I think it is more important to be aware of the peculiar problems that very large organisations present. A number of large industrial concerns are very well aware of those problems and are encouraging the development of small, relatively self-sufficient groupings within the parent firm. In one engineering firm on the outskirts of London they found it expedient to expand their factory, but for geographical reasons it was not possible to build on to their present factory, so rather reluctantly they built a new, small factory a mile or two away from the parent factory. They put about 200 workers in this new small building, but those 200 workers with their supervisors very quickly developed a much stronger group consciousness than the large factory which had about 3,000 people in it. They had a lower rate of absence, they were more contented and they reached a considerably higher level of production. That firm, I may say, has taken the lesson so much to heart that in the expansion that has taken place since then they have built relatively small units which, of course, come under the direction of the centralised organisation, but which are left very much to their own devices as far as the day-to-day running of the work is concerned. The extent to which the decentralisation is possible is affected by a number of factors, including the nature of the product. I think it is possible that some of the so-called palaces of industry are already out of date. It may be in their hey-day they served an advertising rather than a functional purpose. I think this already increasing trend towards devolution in industry is one in which the architect is, and will be, increasingly concerned, because the type of building that he is asked to make plans for will be determined very largely by the modes of thinking and the wishes of the industrial community.

*** The reports from the Technical Groups and the summing-up by Sir Percy Thomas, P.P.R.I.B.A., will be given in our next issue.

R.I.C.S.

The Annual Dinner

THE financial aspects of the Government's capital investment programme for the agricultural industry were mentioned by Mr. Tom Williams, M.P., Minister of Agriculture and Fisheries, when he spoke at the annual dinner of the Royal Institution of Chartered Surveyors, held on March 15, at Grosvenor House, London. The President, MR. S. VVYVIAN HICKS, was in the chair.

MR. WILLIAMS, who was proposing the toast of "The R.I.C.S.," began by saying that we in this country at present were rather like a family which for a number of years had been forced to spend its capital recklessly in order to keep alive. We had managed to survive, but our capital disappeared. "We have now got to make ends meet," he continued, "and that is why in its economic programme for the next four years the Government has laid such a stress on the rôle of agriculture. The task for agriculture is not very easy, but by one means or another we have got to grow more food from our land. The programme we have set the industry is to increase production by 50 per cent. over the pre-war level."

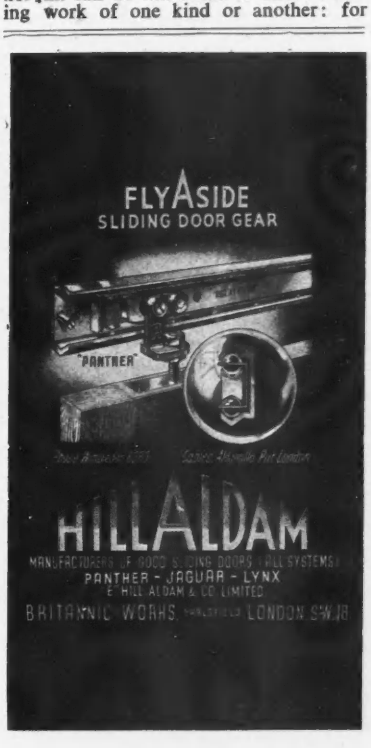
The Minister explained that in planning the capital investment resources of the country the Government had decided to allocate a large proportion to agriculture, and an estimate of the gross investment over the next four years had been placed at between £400m. and £450m. if we were to achieve the programme. "A little more than half relates to machinery and movable equipment," continued the Minister, "while the remainder relates to farm buildings, roads, water supplies and other fixed equipment. The investment programme provides for expenditure on improvement works for agriculture amounting to £24m. in 1948, £29m. in 1949, £33m. in 1950, and £36m. in 1951. Of the £24m. last year, £19¼m. can be attributed to direct building work of one kind or another: for example, three-quarters of a million pounds for new farmhouses and deferred repairs; £15m. for new farm buildings and deferred repairs; £1¼m. for farm roads; £2m. for buildings for ancillary industries, and £¼m. for miscellaneous items."

How did these estimates compare with actual performances during 1948? The Minister said he could not be too precise about this, but there were available the figures showing the value of building licence applications for over £100. From these it was estimated that over the whole year approximately £15m. worth of work would have been done in England and Wales alone. This compared with £19¼m. which included Scotland.

So far as the future was concerned, estimates showed continued increase. It was a large and impressive programme and its completion depended upon adequate supplies of building labour and materials.

THE PRESIDENT, responding, referred to the Town and Country Planning Act, 1947, and said that as an infant this child had teething troubles. The purely planning provisions were progressive, but he could not speak in the same way of certain of the other provisions. He had tried to keep an open mind, but he found that an open mind was rather like an open drain—it was apt to accumulate a considerable amount of rubbish. As the machinery of the Act had got into gear, hardships and anomalies had been disclosed, as the Institution had anticipated might be the case. He hoped that eventually certain amendments would be made in the machinery of the Act and that many of the anomalies would thereby be removed, which would make possible not only development but redevelopment, so urgently needed.

The toast of "The Guests" was proposed by MR. JOHN A. F. WATSON, the senior vice-president, and the MARQUESS OF READING, C.B.E., responded.



THE I.L.O. CONFERENCE

British Delegates Leave for Rome

THE building industry in Great Britain is well represented at the Second Session of the International Labour Office's Building, Civil Engineering and Public Works Committee which opened in Rome on March 16.

Among those who left for Rome last week were Mr. Norman Longley, M.I.O.B., President, N.F.B.T.E.; Mr. A. McTaggart, President of the Federation of Civil Engineering Contractors; Sir John Stephenson and Mr. Richard Coppock, C.B.E., President and Secretary, respectively, of the N.F.B.T.O. These, with representatives of the Ministries of Works and Labour, are the official delegates to the Conference.

Accompanying the delegates will be their advisers, who include Mr. Frank Sleeman, the immediate Past-president of the N.F.B.T.E., Mr. B. H. Meighan and Mr. Robert Kean, O.B.E., of the Federation of Civil Engineering Contractors, and Mr. I. Ernest Jones, the Chief Industrial Official of the N.F.B.T.E. Mr. I. Ernest Jones acts as Joint Secretary of the consultative machinery for the building industry—the National Joint Council for the Building Industry—with the trade union representative, Mr. Coppock.

The agenda for the Session, which is expected to last about 10 days, will deal among other matters with:—(a) Instability of employment in the construction industries. (b) Recruitment and training, and (c) Labour/Management Co-operation.

TIMBER SUBSTITUTES

T.D.A. Conference

REPRESENTATIVES of the timber trade and the principal timber-using industries held a conference at Church House, Westminster, on March 8, as part of their campaign against the use of substitutes for timber in building and other industries.

MR. NORMAN LONGLEY, president of the National Federation of Building Trades Employers, said that until recently timber had little competition in a great number of uses. At the present time the designer, builder and building owner were prohibited from using wood solely because they were told they must not use it. Builders were being deprived of one of the most valuable materials. Undoubtedly timber had been used extravagantly in the past, but if available at the present time, its price would ensure that all possible economy was practised.

The chief qualities that commended it to the builder were its strength, its insulating properties, the finish it gave in natural form, and its pleasantness to live with. Moreover, when using timber the designer could get both the strength and the finish he required with the same component.

Builders should resist every increase in cost. If they did not do this they would find before long there were few left who could afford their products and the industry would face under-employment. The cost of houses was already pressing heavily on the public purse. Where design had been improved to reduce the amount of timber, provided there was no loss of amenity or extra cost, builders raised no objection, but where there had been a substitution of a different material, either with increased cost or with loss of amenity, then they said: "Are we going to all this trouble unnecessarily?" Restrictions often created shortages. If timber remained scarce the nature of buildings would change permanently and they would lose some of their best characteristics.

MR. T. A. STOREY, chairman of the Timber Development Association, made it clear that the Association's suggestion, as shown in their Memorandum on the Economics of Timber Substitution, was not that production of steel, concrete, and other substitute materials should be reduced, and that more timber should be imported to take their place. What they suggested was that if the selection of materials was left to industry, and if industry was not directed to substitute materials irrespective of their competitive ability, but at the expense of timber, these substitutes could and would find their natural markets and timber would once again assume its proper place in industry.

The Association were not suggesting that dollars already available for the purchase of commodities in general could be better spent if timber were substituted for the goods which were actually being purchased. In this respect their opinion had no more claim to consideration than the opinion of any other responsible section of the community.

The whole essence of the case put forward was that dollars could be earned if steel and other substitutes now being used in this country for purposes for which timber was not only cheaper but better, were diverted to their natural and more profitable market in the export trade. Surely, it would be true economy to export steel at anything from £50 a ton to £500 a ton, according to the form in which it was exported, rather than use it to save an import cost of £16 a ton on the timber it supplanted.

It was important that the country should not cling slavishly to procedures induced by the incidence of war. The truth of that might be gathered by the tremendous strides made in the scientific use of wood in America during the last few years. In view of developments which were raising timber to new pinnacles of usefulness in what was probably the most competitive of all markets, it was not wise to attempt to swim against the stream merely because we were confronted with a revolutionary idea.

SIR ARCHIBALD HARRIS, Timber Controller, 1939-1947, said that during the war years the timber trade itself evolved and pursued measures for the ruthless reduction of timber consumption, which made an immense contribution to the maintenance of our Atlantic life-line. But the continuance of the present policy, involving the maximum substitution of timber by any and every other material, irrespective of suitability and economic considerations, was unnecessary and harmful to our national economy.

The speaker went on to refer to the White Paper on European Economic Co-operation, which stated that in the year 1952-3, compared with the pre-war figures, grain production would be nearly doubled, solid fuel output would be increased by rather more than ten per cent., electricity output would be multiplied two-and-a-half times, oil refining would be multiplied six times, steel output would be increased about one-and-a-half times, and copper consumption would be nearly doubled. By contrast with all this expansion, sawn timber consumption would be practically halved. This plan evidently provided for the continuance, and even an intensification, of the present policy of timber substitution.

Factual and statistical evidence led to the conclusion that, in general, the use of substitutes for timber involved the following significant disadvantages: the enforced use of material which was less suitable and more expensive, thereby increasing the cost of the end-product and thus contributing to a rise in the cost of living and a further turn of the inflationary spiral; a direct or indirect increase in the price of goods produced for export, whereas a reduction in price was becoming increasingly imperative; the devotion of existing productive capacity and the creation of additional capacity for the manufacture of these highly-processed substitutes, which absorbed labour, fuel and power, equipment and transport, solely in order to replace timber which required the barest minimum of fabrication for which ample machinery was available. And then there was the diversion of this productive capacity from domestic industrial re-equipment, and more particularly from producing goods for export, which would bring in many times the value in hard currency of the timber which was being mistakenly saved.

The President of the Board of Trade had announced recently that three times as much finished steel would be supplied to Canada this year as was supplied in 1948. We realised the implications of international trade and the many other commodities that we were obtaining from Canada and were not so ingenuous as to suggest that this additional export can be immediately and directly translated into increased imports of timber and plywood. But even if we discounted that encouraging portent and assumed that any substantial relief of our self-imposed timber shortage would temporarily aggravate our adverse trading balance with the Western Hemisphere to a corresponding extent, the recoupment of dollar exchange—far in excess of the original outlay—would be only one item among the widespread benefits that would ensue.

MR. J. L. BAYNES, who was a member of the committee appointed by the Board of Trade, under the chairmanship of Sir Keith Price, to consider the requirements and supplies of timber and plywood for the four years 1949—1953, said that taking all the countries into account, it appeared that we might look for a total of 1,100,000 standards import in the current year, which was about 50,000 standards in excess of last year's import, but was still quite insufficient to cover the estimates on which the committee based the requirements of the country for the same period, and unless we had a pleasant surprise from one of the exporting countries, it would appear that we must still base our economy on strict austerity lines.

This was all the more disappointing in view of the fact that the timber which we required was available, and it was only our failure to meet the needs of Canada by our export that prevented us from getting all the wood we needed. We could not, surely, be complacent at the fact that out of Canada's total importing requirements, we were only supplying a bare ten per cent., as compared with a pre-war share of her orders of 17½ per cent.

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The Late Mr. W. A. Taberer.

The death has taken place of Mr. William Austin Taberer, age 63. He was head of the firm of W. A. Taberer and Co., of Nuneaton, and had been a member of the Nuneaton and District Association of Building Trades Employers for 39 years, being four times president.

THE RIGHT TO A HOUSE

Address by National Federation President

MR. NORMAN LONGLEY, president of the National Federation of Building Trades Employers, who recently left for Rome to attend the second meeting of the Building and Civil Engineering Committee of the International Labour Office, addressed a meeting of the Midland Federation of Building Trades Employers on March 11. The objective of the I.L.O., he said, was to raise the living standards of the people of the world, and building must play an important role in this.

The raising of these standards was vitally important not only to builders but also to the whole industry of our country. We could only raise our national standard of living if other people raised theirs—and so provided us with expanding export markets. The chief items on the building agenda in Rome were: industrial relations; recruitment and training; and the stabilisation of employment in the building industry. Builders had a contribution to make and he felt proud of their achievements.

He went on to say that now the goal of a housing unit for each family was beginning to come into sight we all had a plan for the next phase—a new phase in which we could contemplate the clearance of the slums and their replacement by well planned and well built towns.

The building industry was conditioned by the general economic state of the nation, indeed, of the world. It must realise that national imports of timber could only be cut into so many planks. But he was sure that, within the limits of the nation's economy, the productive capacity and flexibility of their industry could be employed to fuller advantage. And they could do still more if there was more timber. The time had come when the citizens of this country, of whatever social class or income group, must have restored to them the right to decide whether to buy a new house or live in one provided by the local authority, with heavy subsidies from the rates and taxes. He was not opposed to the building of houses to let by local authorities, nor did he dispute the principle that those in the greatest need must have a home first. But he did contend that once the need was established, a man and his family should have an inalienable right to own their own house, and should be given freedom of choice.

PORTABLE ELECTRIC TOOLS

Minister of Labour Suggests Safety Precautions

ATTENTION is drawn in the L.M.B.A. Information Service Circular No. 3/1949, to a note issued by the Minister of Labour suggesting various precautions to promote safety in the use of portable electric tools on building work.

The note states: "For some years now it has been apparent that the use of electricity on building contracts is increasing and in the last two or three years the rate of progress has been rapid. This leads to the question of electrical safety, especially where portable electric hand tools are concerned, because, unless the maintenance of such things is effective, a defect can cause electric shock which, even if slight, may cause a man to be thrown off his balance and fall from scaffolding or other parts of the building.

"Under the Factories Act there are Electrical Regulations which apply to buildings under construction, and there is no obligation under these Regulations to take steps of a more comprehensive character than is customary in normal production factories where such tools are used. It will, however, be realised that the conditions of use on building work are different from those which obtain in an ordinary production factory. Rough usage must be expected and it is difficult to afford protection to the wiring, which is often trodden underfoot or liable to damage from vehicles or materials. In such circumstances the maintenance work necessary to satisfy the requirements of the Regulations is rendered very onerous, and the high percentage of accidents due to portable apparatus is undoubtedly due to failures which closer supervision might have prevented.

"For this reason, therefore, although there is no statutory requirement, it is considered desirable to minimise the risk of electric shock by reduction of voltage, and the value commonly recommended is a maximum of 110 volts. In general this will entail the use of a transformer of a size or rating capable of supplying the whole number of hand tools and portable lights likely to be used on the contract, and provided with a centre tap or accessible neutral point so arranged that the shock pressure to earth will not exceed, say, 55 volts.

"Some contractors engaged in building work have adopted the use of low voltage which has been consistently recommended by the Electrical Branch of the Factory Department of the Ministry of Labour and National Service."

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BUILDING AS AN ART

A Talk to Apprentices

ALTHOUGH some of the work apprentices had to do might seem dull, they were making a contribution towards the recovery of the country, said MR. G. H. A. HUGHES, director of the London Master Builders' Association, when presenting prizes at the Croydon School of Building, recently. He urged them to take a real interest in their work as an art and a craft, and told them that the more they came to love it, the better would their work become.

The history of building, he said, was the history of civilisation, and they would realise a great deal more of what building really meant if in their leisure time they studied the history of the country.

He suggested that they should go still further, if they wanted to take a real interest in their job, and in addition to studying the history of the country and the trade, study the history of their craft. Craft history developed from the old Merchant Guilds, which began in the second half of the twelfth century, mainly in London. These Guilds were part religious, part fraternal, and part designed for the protection of their trade. It was from the last aspect that the craft Guilds developed about a hundred years later, and gradually the actual makers of goods built up their own associations, the Weavers, the Mercers, the Goldsmiths, the Carpenters, the Paviors, and so on. As long as there had been crafts, men had been learning to be craftsmen, and it was among the crafts in the building trade, more perhaps than anywhere else, that craftsmanship had been handed down from father to son.

So the craft Guilds had started to develop the apprenticeship system. Under that system there were really three classes of workers, the apprentice, the journeyman and the master. The master, by that time, knew his craft and wanted to pass it on to others. So he employed apprentices. Some of the early apprenticeship arrangements were most interesting, and there was one important provision from the thirteenth century which still appeared in the Apprenticeship Agreement, the restriction on the quota of apprentices to craftsmen to make sure that no master employed more apprentices than he could adequately train, and to ensure that a proper balance was kept between the various crafts.

Apprenticeship passed through many phases after these early stages. At one time the system was governed by the State, but eventually it passed back into the hands of the industry itself. Training for all parts of the building trade was now a very direct and intimate concern of the employers' associations, and the trade unions, which worked together in what was known as the National Joint Apprenticeship Board, with its Regional Joint Apprenticeship Committees throughout the whole country. Terms and conditions were laid down by those Joint Committees, which took a direct responsibility in training and which, in fact, were parties now to every apprenticeship indenture.

The Building Apprenticeship and Training Council had recently urged that there should be a far greater release of building work, so that adequate numbers of craftsmen might be trained for the future. The time would come when they would have better work to do, and none of them need worry for a single moment as to possibilities for the future, because there was enough work to keep the building trade going at full strength for as long as any of them were likely to be interested.

DISTRICT HEATING

Report of British Mission to America

DISTRICT Heating, the supply of heat and hot water from a central station, has only recently received popular attention in Great Britain. In the United States, however, the buildings in the commercial centres of the larger cities have long been heated from central boiler plants, and district heating of residential property is now becoming quite common.

For this reason the Ministry of Fuel and Power arranged for a mission to visit the United States in 1947 to study installations and collect information there. The report of the mission, which consisted of representatives of Ministries, the Building Research Station and private consultants, has now been issued by H.M. Stationery Office in the National Building Studies series. (District Heating in American Housing. National Building Studies, Special Report No. 7. H.M.S.O. Price 4s. 6d. net.)

The aim of the mission was to present a factual account of existing schemes in the United States and to assemble in one document all possible relevant data, leaving it to others to form their own conclusions on the merits of such schemes in their relevance to conditions in the United Kingdom.

The first part, consisting of a survey and summary, gives a brief and valuable account of the American scene together with broad conclusions which will give the reader much food for thought.

The difficulty of relating widely different conditions in the two countries can be seen by reference to part two, where selected schemes are described in detail. In Atlanta, Georgia, for example, although the average temperature is considerably higher than in Great Britain, the minimum recorded is minus 8 deg. F. Thus, the heating system has to be designed to meet a much higher peak demand than in this country.

Perhaps particular attention will be given to the chapter on Seattle, where the climate and other conditions bear some relation to those of the United Kingdom. The average temperature is somewhat higher than London's, but so is the standard of heating. The relative humidity is about the same, while the fact that in 1946 186 days were cloudy and only 77 clear, emphasises the similarity.

Individual Schemes Described.

The six chapters in Part Two, dealing with individual schemes, illustrate the wide range of applications of district heating in the United States, but in making the selection the mission have been influenced by the desire to choose areas where climatic conditions are similar to ours and where low-rent two-storey houses existed rather than multi-storey blocks of flats. From the technical point of view "projects" using hot water were selected rather than the majority which use steam.

Part Three draws literally from Bulletin No. 20 of the Federal Public Housing Authority, entitled "Selecting a Method of Heating," and dealing with the choice of hot water or steam, and the adoption of central or group systems. The question of costs is very fully considered, including capital costs, interest and amortisation, reserve funds, management labour and fuel costs. It also gives an account of the heat and other utility services provided for small houses in the United States.

Part Four gives technical information and discusses heat losses from the house. American houses are a good deal more "air tight" than their British counterparts, and every effort is made to reduce heat loss to a minimum. Nevertheless, it appears that the comparative lack of ventilation does not induce the same feeling of stuffiness because the house is treated as a whole unit. The pros and cons of hot water versus steam are debated in Chapter 22, while the next chapter draws attention to the respects in which American practice in hot water installations differs from our own. Systems of control for both hot water and steam are described in Chapter 25, which includes a timely warning on the necessity for correct maintenance of such controls.

The chapter on distribution mains with which the main text concludes provides very valuable information on their correct layout and construction which are so essential to success in district heating.

The list of acknowledgments which follows bears tribute to the scope of the inquiry and the unstinted nature of the assistance received from the American authorities.

In the first of the appendices which follow all the statistical tables not immediately vital to the main text are gathered together. Appendix II is concerned with housing policy in the U.S.A., and Appendix III consists of notes on district heating in Canada, reprinted from the Royal Commission on Coal, 1946. Appendix IV is particularly valuable since it contains fairly full details of 25 schemes additional to those described in part two of the report. Other appendices deal with the estimation of fuel consumption, the design of central plants, notes on control systems and a list of documents collected.

The report is profusely illustrated; there are 32 plates in an inset which give an excellent idea of the types of towns and dwellings served. A large number of line drawings is also incorporated in the text. It should thus be easy for the lay reader to obtain a broad view of American experience and conditions while there is no doubt of the value of the technical and statistical information which has been collected and conveniently assembled.

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NEWS IN BRIEF

Fixing Accessories for Building Purposes.

The British Standards Institution has issued "Schedule of Fixing Accessories for Building Purposes" (B.S. No. 1494). Copies can be obtained from the Sales Department of the Institution, 24, Victoria-street, S.W.1, price 5s., post free.

Building Employment in January.

According to the latest figures published by the Ministry of Labour and National Service, the number estimated to be employed in the building and contracting industry fell during January, 1949, by 15,000, from 1,480,000 at the end of 1948 to 1,465,000. These figures compare with 1,497,000 employed at mid-1948.

Welding Abstracts.

The International Institute of Welding, founded last year with the support of the welding societies of eleven countries in Western Europe, North America, South Africa and Australasia, announce the approaching publication of a quarterly "Bibliographical Bulletin for Welding and Allied Processes." Orders to the secretary of the Institute of Welding, 2, Buckingham Palace-gardens, S.W.1.

Imports of Natural Asphaltum.

The Board of Trade announce that, as from March 1, licences may be granted to applicants to import North American Natural Asphaltum, irrespective of whether they are members of the North American Natural Asphaltum Importers' Association or not. Importers will be required to give an undertaking that they will sell or use the material only for purposes approved by the Board of Trade, and to furnish returns of sales and stocks. Applications for import licences should be addressed to Import Licensing Department, B.o.T., Regent-st., W.1.

Nationalising the Building Industry.

Mr. Richard Coppock, C.B.E., general secretary of the National Federation of Building Trades Operatives, spoke on the subject of a nationalised building industry at Chipping Norton recently. Asserting that there would be many difficulties, he explained that there were many industries supplying materials to the building trade. The time would come, he believed, when they would be called upon to run their own industry, and they would then socialise the lot. But, he added, this would demand an economic revolution, because the cost of such a scheme would be colossal.

New R.C.A. Branch.

A branch of the Reinforced Concrete Association is about to be established in the North-west. The inaugural meeting will be held at the Manchester College of Technology on March 30, and further meetings have been arranged. The branch will serve the counties of Cumberland, Westmorland, Lancashire, Cheshire, Flint, Denbigh, Merioneth, Caernarvon and Anglesey, and its object is to bring together professional, scientific and industrial interests "to promote, encourage and improve the art, science and practice of reinforced concrete design and construction and all operations and expedients connected therewith." All members of the Association in the area will, *ipso facto*, become members of the branch, and members outside the area, but within reach of Manchester or Liverpool, where the meetings will generally be held, may also join. The chairman of the branch committee is Mr. G. W. Stokes. The honorary secretary is Mr. S. Williams, 18, Monksdale-avenue, Urmston, Manchester.

TRADE NEWS

Text Book on Sherardizing.

The Zinc Alloy Rust-Proofing Co., Ltd., Shakespeare-street, Wolverhampton, have published a revised text book on "Sherardizing."

Brush Firm's New Address.

Messrs. Conways Products (Hove), Ltd., late of 1, Ellen-street, Hove, 3, have moved to Goldstone-street, Hove, 3, which will be known as Goldstone Brush Works.

Builders' Change of Title.

Commercial Structures, Ltd., Staffa-road, London, E.10, announce that as from March 21, 1949, they will be known as Chamberlain Industries, Ltd., with the same address (tel.: Leytonstone 3678).

A Booklet on Foamed Slag.

Messrs. Foamslag (Tees-Side Production), Ltd., The Red House, Normanby Iron Works, Cargo Hall, Middlesbrough, announce that since their "Foamslag" plant on Tees-side commenced operating, some eighteen months ago, and an adequate supply of lightweight aggregate was made available for use in the north of England, they have produced a booklet, entitled "Foamed Slag" to meet the demand for information regarding the uses of lightweight concrete.

A Firm's Dinner.

The chairman and directors of Rhodes Chains, Ltd., Greenwood and Airvac Ventilating Co., Ltd., and Greenwood and Hughes, Ltd., gave an inauguration dinner to the office, works and warehouse staffs on February 25, at Frascati's Restaurant, in celebration of the 21 years' service of two of the members of their staff (Mr. L. J. Ward and Miss M. Moore). Mr. B. Donald Hughes, the chairman, presented each with a suitable gift to commemorate their loyal co-operation during the time of their service with the associated companies.

The toast of "the Firm" was proposed by the Works Manager, Mr. P. H. Laundy, and replied to by the chairman. The health of "the Guests," proposed by Mr. H. H. Millett, was responded to by Mr. John Perks.

THE SCOTTISH BUILDER

NEW BUILDINGS

Aberdeen.—Cooperage works, barrel stores, workers' accommodation and other buildings proposed for Milhalls Fish Products, Ltd., for which the architects are Tawse & Allen, 243, Union-st., West End, Aberdeen.

Edinburgh.—Warrant granted by Dean of Guild Court for erection by Agriculture Research Council, 6a, Dean's-yard, London, of poultry research station at West Mains-rd., Kings-bldg. Plans prepared by A. G. Ingham, Chief E., Architect & Surveyor, Department of Agriculture for Scotland, St. Andrew's House, Edinburgh. Cost, £83,000.—Warrant granted at Dean of Guild Court for 119 aluminium dwelling houses at Moredun housing area at £170,000.

Glasgow.—Additions, etc., and alterations to be made for the University of Glasgow at the Materia Medica buildings, University-av., for which the architects are Gillespie, Kidd & Coia, Wellington-chbrs., Waterloo-st., Glasgow. Plans in hand for additions, alterations, etc., for the Merchant House of Glasgow at West George-st., for which the architects are Frank Burnet & Boston, 180, Hope-st., Glasgow.

Glasgow.—Corporation to erect public school at Lightburn site, for which the architect is John MacNab, 129, Bath-st., Glasgow.

Glasgow.—Corporation to erect public school at Westland-dr., for which the architect is John MacNab, 129, Bath-st., Glasgow.

Glasgow.—New buildings for G. D. McIllvan to be erected at site near Eglinton-st. and Devon-rd., for which the architects are J. B. Wright & Kirkwood, Carlton House, 26, Blythswood-sq., Glasgow. Rains & Porter, Windarches, Hull, propose buildings and garages, etc., at Dumbarton-rd., for which James C. Houston, 139, Muirdrum-av., Glasgow, S.W.2, is architect.

Greenock.—Plans are in hand for a church, etc., for the Church of Scotland at Bow Farm-Auchneath area, for which the architects are J. B. Wright & Kirkwood, Carlton House, Blythswood-sq., Glasgow.

Muirhead.—Lanarkshire C.C. is to carry out scheme of additions and alterations, etc., at £9,000, at St. Joseph Catholic school, for which the architect is William Watt, Albert-rd., Motherwell.

Newmains.—Plans are in hand for dining department and central kitchen to be erected at the Public School, for which the architect is William Watt, Albert-rd., Motherwell.

FUTURE CONSTRUCTION

PUBLIC APPOINTMENTS

Full details of Public Appointments open will be found in the Advertisement pages of this and previous issues.

CONTRACTS OPEN

For some contracts still open but not included in this list see previous issues. Those with an asterisk are advertised in this number. The dates at the heads of paragraphs are those for the submission of tenders; a dagger (†) denotes closing date for applications; the name and address at the end refer to the person from whom particulars may be obtained.

BUILDING

MARCH 24.

†***Bristol T.C.**—17 houses at Lawrence Weston. City A. Dep. £2 2s.

†***East Sussex Standing Joint Committee.**—Police houses at 6 sites. E. A. Verger (F.), County A., County Hall, Lewes.

MARCH 25.

†***Croydon C.B.**—Prefabricated classroom block and additions at Gonville School, Thornton Heath. Chief Ed. Officer, Katharine-st. Dep. £1. Tenders by April 28.

***Huntingdon C.C.**—Extensions to hut at Old Grammar school. T. H. Longstaff, County S. & Architect, Walden House.

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MARCH 28.

†***Bromley T.C.**—102 houses at Coppice estate. B.E., Municipal Offices. Dep. £2 2s.

Dalton-in-Furness U.D.C.—36 houses at Aniy Cross site. E. & S., Town Hall. Dep. £2 2s.

†***Dudley C.B.**—Two shops and 2 flats at Yew Tree Hill estate. Boro' A., Priory Hall. Dep. £2 2s.

MARCH 29.

†**Abram U.D.C.**—66 dwellings at Grasmere-terr. J. C. Prestwich & Sons, Bradshawgate-chbrs., Leigh, Lancs. Dep. £2 2s.

Barnsley T.C.—26 houses at Athersley estate. B.E., Town Hall. Dep. £2 2s.

***Bridgwater T.C.**—50 houses at Hamp estate. B.E., Town Hall. Dep. £2 2s.

†***Bucks Standing Joint Committee.**—(a) One pair of houses at Amersham, Stanley Hill; (b) 1 house at Ashley Green; (c) 1 house at Brill. County A., County Offices, Aylesbury. Dep. £2 2s. Tenders by April 28.

Lleyn R.D.C.—10 houses at Abersoch; 2 at Morfa Nevin; repairs and adaptations to huts at temporary housing accommodation. C., Metro-bldgs., Pwllheli.

†**South Lancs Housing Assocn.**—26 houses off Wigshaw-la., Culceth. J. C. Prestwich & Sons, M.A. (F. & A.), Bradshawgate-chbrs. Leigh, Lancs. Dep. £2 2s.

MARCH 29.

South Cambridgeshire R.D.C.—38 houses at various sites. Housing Officer, County Hall, Hobson-st. Dep. £2 2s

MARCH 30.

***Melton Mowbray U.D.C.**—40 houses at Asfordby and Nottingham-rds. site. W. H. Jarvis, E. & S., Egerton Lodge. Dep. £2 2s.

†***Northampton C.B.**—Erection of Gladstone Junior school, including kitchen, dining-room and boiler-house. H. C. Perrin, Chief Education Officer, "Springfield," Cliftonville, Northampton. Dep. £2 2s.

***Yeovil T.C.**—Four houses at Milford estate. Petter, Warren and Roydon Cooper (FF.), Old Oxford Inn, West Hendford, Yeovil. Dep. £2 2s.

MARCH 31.

Abergavenny T.C.—38 houses at Llwynu Farm estate. B.S., Town Hall. Dep. £2 2s.

Berks C.C.—Police houses at 7 sites. County A., Wilton House, Parkside-rd., Reading. Dep. £2 2s. each site.

†***Ches. C.C.**—Applications invited for erection of primary schools at 9 districts. E. M. Parkes (F.), County A., The Castle, Chester. Dep. £2 2s. Tenders by May 11.

Cudworth U.D.C.—20 houses. J. Armitage, S., Council Offices. Dep. £1 1s.

†***Enfield U.D.C.**—42 flats at Park-rd. E. & S., 7, Little Park-gdns., Enfield. Dep. £2 2s. Tenders by April 29.

†**Padiham U.D.C.**—16 houses at Slade-la. estate, W. Veevers, C., Town Hall. Dep. £2 2s.

APRIL 1.

†***Dorset C.C.**—Erection of Holy Trinity Primary School, Weymouth. C. P. Britton, C., County Hall, Dorchester.

APRIL 2.

Chingford T.C.—7 houses at Westward-rd. B.E. & S., Town Hall. Dep. £2 2s.

Dunmow R.D.C.—18 houses with external services at The Downs. D. G. Armstrong, architect, 57, High-st., Braintree, Essex. Dep. £3 3s.

APRIL 5.

Camelford R.D.C.—2 houses at Davidston. Andrew & Randell, architects, Hepworth-chbrs., St. Austell.

***Ware R.D.C.**—(a) 2 pairs of bungalows, Thundridge; (b) 2 blocks of 4 houses each at High Cross. S., 97, New-rd., Ware. Dep. £1 1s. each site.

APRIL 6.

Batley T.C.—72 houses and flats at Staincliffe estate. B.E., West House, Hanover-st.

***Esher U.D.C.**—Public convenience at Ferry-rd., Long Ditton. E. & S., Council Offices. Dep. £1 1s.

APRIL 8.

***Monmouthshire C.C.**—New junior and infants' school at Ragiet nr. Severn Tunnel. Colin L. Jones (F.), County A., Queen's Hill, Newport, Mon. Dep. £3 3s.

***Southport C.B.**—Alterations, repairs and decorations, etc., at 91, Leyland-rd. B.E.

***Wisbech T.C.**—12 aged persons' dwellings at West-st. redevelopment area. B.E. & S., Town Hall. Dep. £1 1s.

APRIL 9.

East Grinstead U.D.C.—Internal works and laying of services, drainage and internal and external decorations to recreation hut, Hollandsway, Stonequarry estate. C., Council Offices, East Court.

APRIL 11.

***Chatham T.C.**—Six pairs of houses at Wayfield housing estate. H. D. Peake, M.Sc., B.E. & S., Town Hall. Dep. £2 2s.

***Eton R.D.C.**—(1) Eight houses with road and drainage works at Fulmer site; (2) ten houses with road and drainage works at Taplow site. Sir John Brown, A. R. Henson & Partners, 117, Sloane-st., S.W.1. Dep. £3 3s. each site.

***Huntingdon C.E.C.**—Kitchen and dining-room for Fletton County Primary school. T. H.

Longstaff, County S. and Architect, Walden House.

*St. Helens C.B.—44 houses at Gaskell-st. site. B.E. Dep. £2 2s.

Stowmarket U.D.C.—60 flats at Recreation-rd. Housing S., Council Offices, Ipswich-rd. Dep. £2 2s.

APRIL 13.

Eston U.D.C.—42 houses at Eston No. 4 (Jubilee-rd.) site. E. & S., Normanby-rd., South Bank. Dep. £5 5s.

APRIL 15.

*Thame U.D.C.—New cattle market at North-st. Raymond C. White (F.), Cecly House, Church-st., Aylesbury. Dep. £8 8s.

APRIL 16.

Long Eaton U.D.C.—12 bungalows at Draycott-rd., scheme No. 16a, Townside estate. E., Town Hall. Dep. £2 2s.

APRIL 18.

Darwen T.C.—18 dwellings at Redvers-rd. housing scheme No. 2. B.S., Municipal-bldgs. Dep. £2 2s.

APRIL 20.

*Brighton C.B.—54 houses, Section 3a, and 70 houses, Section 4b, at Lower Bevendean estate. B.E. & S., 26-30, King's-rd. Dep. £2 2s. each section.

APRIL 25.

*Salop C.C.—Alterations and redecoration at Walford Manor and Hall for hostel accommodation. A. G. Chant, County A., 5, Belmont, Shrewsbury. Dep. £2 2s.

*Shropshire C.E.C.—Erection of infants' school at Dawley-rd., Wellington. Alterations, repairs and redecorations at Haughton Hall, Shifnal. Hobbiss & Hobbiss, 36, Waterloo-st., Birmingham 2. Dep. £2 2s., payable to C.C. Alterations and improvements at County High school and Girls'/Infants' County school, Bishop's Castle. S. N. Shrimpton & Son, 5, Castle-st., Ludlow. Dep. £2 2s., payable to C.C

NO DATE.

*Herts C.C.—Applications invited from contractors for works of building and maintenance. C., County Hall, Hertford.

PAINTING, ELECTRIC LIGHTING, MATERIALS, ETC.

APRIL 1.

Redditch U.D.C.—E. & S. (Materials).

APRIL 4.

*Liverpool Corporation Water Works.—Painting, colouring and papering at various premises. Water E., 55, Dale-st.

Royton U.D.C.—E. & S. (Materials).

APRIL 14.

Sutton-in-Ashfield U.D.C.—E. & S., (Materials).

APRIL 15.

*Sunderland E.C.—Central heating and hot water supply, etc., at Hill View proposed primary infants' school. Education A., Mowbray Villas, Ryhope-rd. Dep. £2 2s.

ROADS, SEWERAGE AND WATER WORKS

MARCH 29.

Sunderland C.B.—Extension to Dean-terr. trunk sewer. B.E., 27, Fawcett-st. Dep. £5 5s.

MARCH 31.

Reigate T.C.—Surface dressing of roads. B.S.

APRIL 2.

Chesterfield T.C.—Roads and sewers at Newbold estate. B.E. & S. Dep. £2 2s.

Droitwich T.C.—Surface dressing of roads. B.E. & S.

APRIL 4.

Bristol T.C.—Roads and sewers at Brislington Trading estate. City E., 7, College Fields. Dep. £2 2s.

APRIL 7.

†*Twickenham T.C.—Road and sewer works at housing estates. A. S. Knolles, B.Sc., M.Inst.C.E., Municipal Offices.

APRIL 9.

Felixstowe U.D.C.—Preparation of housing site No. 9 between Mill-la. and Grange-rd. E. & S., Town Hall. Dep. £2 2s.

Mansfield Woodhouse U.D.C.—Sewerage works at Leeming-la. and Northfield-ave. Elliott & Brown, Stanley House, Pelham-rd., Nottingham. Dep. £3 3s.

APRIL 11.

Beaminster R.D.C.—Laying of spun-iron mains, etc., at Beaminster and Netherbury. Lemon & Blizard, Castle-la., Southampton. Dep. £2 2s.

Wakefield T.C.—Roads and sewers at Eastmoor estate extension No. 3. City E.

Walsall C.B.—Construction of Western main sewer. B.E. & S. Dep. £3 3s.

APRIL 14.

Harpenden U.D.C.—Surface dressing of roads. E. & S.

APRIL 19.

Chapel-en-le-Frith R.D.C.—2,400 yds. of 3-in. water mains, etc., at 3 parishes. Brady & Partington, Market-st. Dep. £5.

"PRICE BUILD-UP TO-DAY"

New Consolidated Edition

THE new (consolidated) edition of "Price Build-up To-day" is now off the press. In this book, 60 pp. and cover, are brought together all the articles on "Price Build-up To-day," compiled by "Cain" (V. C. Abell), and published in *The Builder* in 1947 and 1948, including those articles included in an earlier reprint (which ran to three editions), published last year. An entirely new section is incorporated of tables for converting labour constants to cash equivalents. This should be invaluable to builders operating Incentive Schemes and helpful to operatives taking part in such schemes.

All the data have been revised in conformity with Wages Increases (including the upgrading of February last), and the calculations make allowance for the National Insurance Scheme.

The analyses cover separate wage rate areas (i.e., Outer London, Grades A, A1 and A2), and the final rates shown are the net cost on site of all principal trades, exclusive of cost of scaffolding, transport, site supervision, establishment charges and profit.

Price, 7s. 6d. (7s. 10d., post free), the book is obtainable from the Publisher, *The Builder*, 4, Catherine-street, Aldwych, London, W.C.2.

GENERAL BUILDING WORK (LONDON)

The Editor would be glad to receive from architects, quantity surveyors and contractors authentic information regarding proposed new building work and contracts placed. Information should reach THE BUILDER *not later than Wednesday morning each week.*

Ealing.—Houses.—Erection of 440 experimental type houses. M.o.W., Abell House, John Islip-st., S.W.1.

Enfield.—Flats.—U.D.C. propose 42 flats, Park-rd. E. & S., 7, Little Park-gdns.

Rotherhithe.—Cold Store.—Chambers Wharf and Cold Stores, Ltd., Llewellyn-st., S.E.16, propose new cold storage premises at 57/61, Bermondsey-wall.

Thornton Heath.—Classroom Block.—Croydon B.C. propose prefab. classroom block, Gonville School. Chief Educ. Officer, Katharine-st., Croydon.

Tottenham.—Fire Station.—Middlesex C.C. propose fire station, Northumberland Park. C. W. Radcliffe, clerk, Guildhall, Westminster, S.W.1.

Uxbridge.—Houses and Flats.—U.D.C. propose 58 houses and 16 flats on Evelyn's Estate. Surveyor, Council Offices.

Westminster.—Medical School.—North-West Metropolitan Hospital Board, 11a, Portland-pl., W.1, propose hospital medical school, Vauxhall Bridge-road, S.W.1.

(PROVINCIAL)

Bakewell.—U.D.C. approved attested cattle market at Auction Mart.

Bentley.—West Riding E.C. propose primary schools at Jossey-la.

Blackburn.—T.C. propose municipal café at Corporation Park and day nursery at Albion-st.

Bolton.—T.C. approved:—Workshops and storerooms at Thynne-st., for Hargreaves, Hamilton & Co., Ltd.; extensions to warehouse and offices, Radcliffe-rd., for F. Brown (Grocers), Ltd.; extensions and additions to factory, Burns-st. Mill, for J. W. Howarth.

Bradwell.—Derbys. E.C. propose grammar school at Hope Valley.

Brighouse.—T.C. approved rebuilding Phœnix Mill, Phœnix-st., for W. H. Sladin. T.C. propose development of site at Wakefield-rd., for Industrial estate. T.C. propose 24 houses at Clifton estate.

Burnley.—Salem Congregational Church members propose church nr. Rosehill housing estate.

Bury.—T.C. propose central omnibus station. E.C. propose dining centres at Unsworth school and St. John's school.

Chesterfield.—C. Bradley, Cavendish-st., propose offices and shops at Knifesmith's Gate.

Consett.—U.D.C. planning business premises at Cutlers Hall estate.

Crook.—Newcastle Breweries, Ltd., Newcastle, to erect hotel. Plans by T. A. Page, Son & Hill, 75, King-st., South Shields.

Droitwich.—R.D.C. approved additions to works, Upton Warren, for Queslett Co.

Durham.—City Council propose 52 houses at Wakenshaw-rd., Donnini-pl. and Long Acres. Six shops with 4 flats above proposed at Gort-pl. at Sunderland-rd. housing estate. W. J. Greene, Town Hall, City E.

Durham.—R.D.C. to erect 64 houses at Seamside. Plans by Housing Architect, J. F. Willis, Council Offices, Byland Lodge, Durham.

Eccles.—Lancs. E.C. propose county junior and infants' school, Alder Park, Willink & Dod (F.), Cunard-bldg., Pierhead, Liverpool 3.

Felling-on-Tyne.—U.D.C. to erect 50 houses. Plans by S., H. Fawcett, Council Offices.

Felling-on-Tyne.—Spence and Price, St. Mary's-pl., Newcastle-on-Tyne, prepared plans for bottle exchange building, Carlisle-st., for J. S. Armstrong. C. S. Errington, 46, Grainger-st., Newcastle, is architect for mineral water bottling factory for A. Tower & Co., Ltd., Newcastle-on-Tyne.

Gateshead.—Chief Architect (H. J. Cook) prepared revised plans and estimates at £20,288 for provision of public conveniences at Saltwell Park.

Gateshead.—Plans approved for factory extensions at Team Valley estate for H. Leverton & Co., Ltd., and alterations at "Ship Inn," Wrekenton, for Isaac Tucker & Co., Ltd.

Golborne.—U.D.C. received approval of M.H. for 120 houses for 1949.

Guisborough.—Vaux and Associated Breweries, Ltd., The Brewery, Sunderland, propose conversion of Upsall Hall into hotel at £9,000.

Hazel Grove and Bramhall.—U.D.C. received allocation of M.H. for 30 additional houses.

Hexham.—Newcastle-on-Tyne Hospital Board considering scheme estimated at £800,000 for rebuilding war-time general hospital. Board's planning architect is P. H. Knighton, "Dunira," Osborne-rd., Newcastle-on-Tyne.

Jarrow.—Corporation Housing Committee propose to step up house-building from 150 to 400 houses per annum.

Kirkby Stephen.—Westmorland E.C. propose secondary school.

Macclesfield.—T.C. propose public abattoirs.

Manchester.—T.C. approved:—Extensions to printing works, Store-st. and South-st., Openshaw, for Gardiner & Co. (Manchester), Ltd., Alan Wych, architect, 13, Hyde-rd., Denton; additions to brewery, Monsall-rd. and Collinson-st., Newton Heath, Wilson's Brewery, Ltd., S. C. Emerson, resident architect, Brewery Offices; two storey extension, 2, Brookside-rd., Moston, for A. Lupton & Co., Ltd.; additions to factory, High-st., Gorton, for J. Johnstone & Co., S. Heathcote, architect, 5, Park-ave., Romiley; extensions to factory, Factory-la., Blackley, National Wire Works, Ltd., A. Leach (L.), architect, Fountain-st., Middleton; additions to warehouse and offices, 50, Piccadilly, for Joseph Hoyle Sons, Ltd., H. S. Fairhurst & Son (F.), 55, Brown-st.

Manchester.—Lancs Congregational Union, 244, Deansgate, propose church at Baguley Hall estate, Northenden.—Methodist Church Authorities, Central-bldgs., Oldham-st., propose church at Grangepark-rd., White Moss, Blackley.

Matlock.—United Services Club (Matlock), Ltd., Princes-bldgs., propose extensive alterations and additions to club premises.

Middlesbrough.—Revised plans prepared by Samuel Smith's Tadcaster Brewery for hotel at The Crescent, Middlesbrough.

Newcastle.—Thomas Hedley & Sons, Ltd., City-rd., to construct offices and canteen, etc., at works.

Newcastle - on - Tyne. — Hetherington and Wilson, County-chbrs., Westgate-rd., are architects for licensed premises at Fawdon for Vaux and Associated Breweries, Ltd., The Brewery, Sunderland.

Newcastle-on-Tyne.—Plans prepared by C. Solomon, 3, St. Mary's-pl., for clothing factory at Blenheim-st. for Best Wear (Newcastle), Ltd.

Newcastle (Staffs).—Clayton Methodist Church members propose church at Clayton.

North Riding.—M. of E. approved the R.C.'s building programme this year as follows: Catterick Camp Secondary Modern School, Redcar Infants' School, Redcar Junior School, Saltburn Infants' School, Scarborough Barrowcliffe Estate Infants' School, and Scarborough Barrowcliffe Estate Junior School.

Northumberland.—E.C. to erect canteen kitchens at Hedley-on-the-Hill School, Longbenton School, Sheresweod School, Lynmouth School and Newburn Manor School. Plans by County A., W. W. Tasker, County Hall, Newcastle.

Oldham.—E.C. propose primary school at Waverley-st. at £50,000.

Otley.—West Riding E.C. propose county primary school at Newall.

Preston.—R.D.C. received allocation for 155 additional houses and 15 by private enterprise.

Saddleworth.—U.D.C. propose 200 additional houses on selected sites.

Salford.—T.C. approved:—Rebuilding 233, Chapel-st., for M. Ash, 2, Victoria-st., Manchester 3; hat factory at Caxton Hall, Chapel-st., for J. & J. Rabin, Ltd., Ormes-bldgs., Parsonage, Manchester 3.—T.C. propose 30 three-storey flats, Grosvenor-sq., Broughton, and 42 flats at Bury-st.

Sheffield.—C. Kenyon & Sons, Ltd., Boundary Rolling Mills, Wisewood, propose additions to works at Loxley-rd.—T.C. propose 41 terrace houses at Littledale estate.

Silsden.—U.D.C. received allocation of 24 additional houses and 6 by private enterprise.

Sprotborough.—West Riding E.C. propose primary school at Richmond-hill.

Stanley.—U.D.C. to erect 50 houses. F. R. Heslop, S., Council Offices, Front-st., Stanley, Co. Durham.

Stockport.—T.C. approved:—Extensions to works, Bramhall Moor-la., Hazel-gr., Mirrlees, for Bickerton & Day, Ltd.; additions, Egerton works, Hatton-st., for F. W. Waller & Co., Ltd.; extensions and additions to works, 39, Derby-range, for Heaton Moor Printing Co.—T.C. received allocation of 615 houses and 123 by private enterprise.

Stretford.—T.C. approved:—Additions at Trafford Wharf-rd., for Manchester Ship Canal Co., Ltd.; laboratory at works, Westinghouse-rd., for Courtaulds, Ltd.; additions to works, Fraser-rd., for Sterling Varnish Co., Ltd.—T.C. propose block of 22 flats and communal garden at Chester-rd., Longford Bridge; received allocation of 330 houses and flats at Sandy-la., Barton-rd., Moss Park, Firs Farm and Park-rd. sites.

Tottington.—Lancs E.C. propose completion of secondary school. Plans by Adshead, Topham & Adshead (L.), 21a, Broad Oak-rd., Worsley.

Warrington.—T.C. approved:—Factory at Vernon-st. for Jacksons (Files), Ltd.—T.C. propose summer school at Prestatyn at £19,464.—E.C. propose dining centre at Oakwood school, Oakwood Park.

Workington.—T.C. approved:—Offices at Oxford-st. for North-Western Electricity Board (No. 6 sub-area). J. Saul (L.), National Provincial Bank-chbrs.

TENDERS

* Denotes *accepted*.
† Denotes *provisionally accepted*.
‡ Denotes *recommended for acceptance*.
§ Denotes *accepted subject to modification*.
¶ Denotes *accepted by H.M. Government Departments*.

Bowdon.—Eight houses at Priory-rd., for U.D.C. J. Price, Nunn & Partners (F.), 180, Oxford-rd., Chorlton-upon-Medlock, Manchester 13: *W. Clifford, 3, Leyland-av., Didsbury, Manchester 20 (4); *The Rialto Building Co., Altrincham, Ches (4).

Burton-on-Trent.—116 houses at Manners estate, for T.C. G. Moncur, M.Inst.C.E., B.S.: *Cornes Construction Co., Ltd., Lichfield-st., Hanley, Stoke-on-Trent.

Chester.—Six houses, drainage and septic tank at Broomhill, Barrow, for R.D.C. H. Beswick (L.), 19, Newgate-st.: *Morton Browne, Ltd., Cow-la. Bridge, Chester, £8,138.

Congleton.—27 houses at Rood Hill estate, contract No. 3, for T.C. C. Brown, M.I.Mun.E. (A.), B.E. & S., Town Hall:

Barker Bros., Macclesfield	£38,416
Machin & Allen, Congleton	37,700
Cornes Construction Co., Stoke-on-Trent	36,140
Senior Building Co., Cheadle	35,570
H. A. & F. Richardson, Wilmslow ...	34,843
W. G. West, Ltd., Stockport	34,746
F. Blurton & Co., Hazel Grove	33,656
Hugh Owen & Son, Stockport	33,544
A. J. Pass, Congleton	32,905
B. Loughlan, Stockport	31,758
H. Charlesworth, Congleton	31,241
*J. T. Yearsley, "Parnelscroft," Park-la., Congleton	30,529

Consett.—36 houses at Bradley-sq., Leadgate, for U.D.C. J. J. Eltringham, Derwent-st., Blackhill: *Henry Ayton & Sons, George-st., Blackhill, Co. Durham.

Crook.—50 houses for U.D.C. Architects, T. A. Page, Son & Hill, 75, King-st., South Shields: *J. Twiname, Cockermouth.

Ealing.—32 flats and 12 old peoples' dwellings at South-East Northolt, for T.C. C. W. Seddon, B.E.:—

J. B. Connelly, Ltd., London, W.1 ...	£88,001
H. J. Walker & Sons, Bristol	87,500
Ricketts & Hubbard, Ltd., N.W.1 ...	51,973
Ferris Bros., Acton, W.3	51,279
Rawlings Bros., Ltd., W.5	49,261
Alex A. Shaw, W. 3	46,668
W. F. Davey & Co., Ltd., Hounslow ...	46,437
Wesley Estates, Ltd., N.W.10	44,941
Gorham (Contractors), Ltd., Goring-by-Sea	43,962
G. Ward (Ealing), Ltd., W.5	43,638
F. Troy & Co., Ltd., S.E.1	43,446
Unera Construction Co., Ltd., W.14 ...	42,674
Geo. Moss & Sons, Ltd., Southall	42,503
Francis Jackson Contractors, Ickenham	42,227
Davis Contractors, Ltd., N.W.6	41,902
S. & K. Darvil, Ltd., Watford	41,573
Roger Miller & Co., Ltd., Hounslow ...	40,419
*Geo. Moss (London), Ltd., Northolt Park	39,821

Feiling.—98 houses for U.D.C. Housing Architect: D. W. Green, Council Offices: G. Wimpey & Co., Ltd., Newcastle-on-Tyne (48); *Direct Labour (50).

Gateshead.—Six flats and six shops at Coach-rd. Estate and five flats and one shop at Blue Quarries Estate, for T.C. Chief Architect: H. J. Cook, Municipal-bldgs., Gateshead: *J. J. Hedley, 6, Oxford-st., Newcastle-on-Tyne, £24,019.

Lancashire.—Works for C.C. G. Noel Hill (F.), County A., County Offices, Fishergate-hill, Preston. Alterations and additions at Winmarleigh Hall for conversion into agricultural institute: *R. L. Dilworth, Ltd., Damside-st., nr. Garstang, Lancaster, £9,100.

Liverpool.—Reconstruction of top floor of Workshops for the Blind, Cornwallis-st. A. Neville Holt (F.), Exchange-st. East, Liverpool: *Rimmer Bros. (Liverpool), Ltd., Cheadle-av., Old Swan, Liverpool 13.

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THREE WEEKS

FROM RECEIPT OF ORDER

ENGLAND'S LARGEST GLAZING CONTRACTORS

L.C.C.—Contracts exceeding £2,500 in value placed by L.C.C. during period ended March 10:—Conversion of St. Olave and St. John Institute, Bermondsey, into restaurant, Snelling & Rayment, S.W.19. Electrical installation at Netley-st. School, St. Pancras, S.W., Holmes & Larkinson, Holloway. Electrical installation at Queen's Head-st. Girls' School, Islington, N., Escott Bros., Ltd., South Woodford.

¶London (Admiralty).—*Ford*, R.N.A.S. Site works and houses, W. J. White & Sons, Ltd., 1, Bayford-rd., Littlehampton. *Culdrose*, R.N.A.S., Site works for works, E. Thomas, King's-av., Falmouth. *Hillingham*, Reconstruction of pier, Mears Bros. (Contractors), Ltd., 154, Sydenham-rd., London, S.E.26. *Belfast*, R.N.A.S., Piled foundations to boiler-house, Concrete Piling Ltd., Ladas-dr., Belfast. *Culham*, R.N.A.S., Construction of canteen, Y. J. Lovell & Son, Ltd., Marsham-la., Gerrards Cross, Bucks.

¶London (Air Ministry).—Contracts to value of £500 or over for week ended March 12:

Building work: Kerridge (Cambs.), Ltd., Cambridge; Morleys (Builders), Ltd., Derby; Bosworth & Wakeford, Ltd., Daventry, Northants. *Painting hangars:* M. J. Gleeson, Ltd., North Cheam, Surrey.

¶London (M.O.W.).—Contracts placed by M.O.W. during week ended March 5:—

London: Post Office Research Station, Dollis Hill, N.W.2, Internal painting, C. & T. Painters, Ltd, Mordaunt-rd., Harlesden, N.W.10; Royal Albert Dock, Quarantine station, G. F. Miller & Co., Ltd., Thorpe-rd., Forest Gate, E.7; South Block, Government Offices, Whitehall, Internal cleaning, Fields, Ltd., Chandos House, Palmer-st., S.W.1. *Cornwall*: H.M. Coastguard Station, St. Just, Dwellings, etc., W. Trathen, Green-la., Redruth. *Devonshire*: M/Ag. & Fisheries, Male Workers' Hostel, Chulmleigh, Alterations and adaptations, Stephens & Sons (1941), Ltd., Okehampton-st., Exeter. *Durham*: Harton County Prim. School, South Shields, School meals accommodation, J. E. Gardner, Ltd., 136, St. Cuthberts-rd., Gateshead. *Glamorgan*: Post Office Building, Western-av., Cardiff, Alterations, etc., John Morgan (Builders), Ltd., 14, Cathedral-st., Cardiff. *Gloucester*: Central Telephone Ex., Bristol, Internal decs., Alfred Bagnall & Son, Ltd., 146, West-st., Bristol. *Hampshire*: Portchester-rd. County School, Bournemouth, Temporary school bldgs., W. Hayward & Sons (Bournemouth), Ltd., 400b, Holdenhurst-rd., Bournemouth; Stanmore School, Winchester, Dining accommodation, J. J. Udalls Building Co., Ltd., West Quay-rd., Southampton; Regent's Park School, Southampton, Classrooms, H. G. Ross & Sons, Ltd., Victoria-rd., Netley Abbey, Southampton. *Monmouthshire*: Min/Supply Housing Estate, New Inn, Repair of houses, W. & A. Davies, Ltd., Abersychan, Mon. *Norfolk*: St. Clement's School, Terrington, Kitchen and dining-room, Walter Lawrence & Son, Ltd., Ventnor House, London-rd., Swaffham, Norfolk. *Oxfordshire*: Dr. Radcliffe's School, Steeple Aston, Temporary classrooms, J. F. Booth & Son, 19, North Bar, Banbury. *Som.*: Westover Sec. School, Bridgwater, Kitchen and dining-room, J. Standerwick & Sons, Ltd., Taunton-rd., Bridgwater. *Staffs*: M.N.I. & M/F Corporation Hostel, Newcastle-under-Lyme, Alterations and redecorations, Geo. A. Poole, 37, Liverpool-rd., Newcastle, Staffs. *Sussex*: Friston, West Dean, Four cottages and one forester's hut, Y. J. Lovell & Sons, Ltd., 10, Gildredge-rd., Eastbourne. *Warwickshire*: Smethwick Hall Boys' School, Smethwick, Temporary school bldgs., W. B. & F. T. Archer, Holyhead Works, Rookery-rd., Handsworth, Birmingham. *Yorks*: Bridlington Head Post Office and Tele. Ex., Erection, Bernard Pumfrey, Ltd., Wintern Works, Lea-rd., Gainsborough, Lincs.

¶London (War Dept.).—Contracts placed by War Dept. week ended March 5:—

Ches: Miscellaneous work, Battye & Jones, Ltd., Birkenhead. *Mon*: Miscellaneous work, Miles Bros., Ltd., Cardiff. *Lancs*: Miscellaneous work, Levi Thomason, Lymm, Warrington. *Notts*: Building work, Bosworth & Co. (Contractors), Ltd., Nottingham. *Surrey*: Building work, Thomas Higgs & Co., Ltd., Woking. *Devon*: Miscellaneous work, W. J. Avery, Okehampton.

Manchester.—Additions to factory at Healdgr., Rusholme, for Wm. Chapman, Ltd.: *G. Waite & Co., 14a, Newton-st., Manchester 1.

Newcastle-on-Tyne.—Alterations at Churchill-st., for Northern Beef Co.: *Tipping Bros., St. Mary's-pl., Newcastle-on-Tyne.

Newcastle-on-Tyne.—29 houses at Ilfracombe-gdns., Cliftonville-av., and Clovelly-av.: *J. McEwan, 20, Croftsway, Newcastle-on-Tyne.

Newcastle-on-Tyne.—Works extensions for Selborne Domestic Engineering Co., Ltd., Selborne-gdns., Jesmond: *Thomas Clements & Sons, Dene Joinery Works, Jesmond, Newcastle-on-Tyne.

Oldham.—Erection of new buildings, roads and site works at Glodwick-rd., for C.B. Cruickshank & Seward, Architects, 16, Princess-st., Manchester 1: *William Townson & Sons, Ltd., Building & Civil Engineering Contractors, Park Hill-st., Bolton, £74,423.

Oldham.—Extensions at Atlas Meter Works, for George Orme & Co. Young & Purves (A.), 12, St. Ann's-st., Manchester 2: *T. Partington & Sons (Builders), Ltd., Palm Hill, Stocks-la., Chadderton, nr. Oldham. Steelwork: *Edward

Wood & Co., Ltd., Ocean Ironworks, Trafford Park, Manchester 17.

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Orpington.—32 houses at Orpington Garden estate, for U.D.C.: *The Foven Construction Co., Ltd., St. Mary Cray & Dartford, £43,608.

Pembroke.—16 houses at Manorbier, for R.D.C. J. Owen Parry & Lewis, Ammanford: *Wm. Davies & Son, Pembroke Dock, £1,350 per house.

Pickering.—Eight houses at Wrelton, for R.D.C. H. Smith, architect, Burgate-chbrs.: *A. Taylor & Sons, Westgate, Pickering, £14,172 (subject to M.H. approval).

Redcar.—Electricity showrooms. Architects, L. J. Couves & Partners, Carliol House, Newcastle: *H. Peacock, Builder, Guisborough, North Riding.

Repton.—34 houses at Hartshorne and Willington sites, for R.D.C. A. P. Hancock, S., Council Office, The Poplars, Rollington, Burton-on-Trent: *J. C. Grewcock, Burton-rd., Woodville, Burton-on-Trent, £31,097 (26); *W. Wood (Heanor), Ltd., Carlton House, Fletcher-st., Heanor, Derbys, £10,150 (8).

Rotherham.—Extensions for operating theatre and X-ray department, Rotherham Hospital, Doncaster-gate, for Regional Hospitals Management Committee: *Beeden, Ltd., Thrybergh, Rotherham, £9,963.

Salford.—Six shops and maisonettes, Eccles Old-rd., Pendleton, for T.C. W. Albert Walker (G.M.), M.Inst.C.E., C.E., Town Hall: *G. Fisher (Fallowfield), Ltd., Albany-rd., Chorlton-cum-Hardy, Manchester 21, £22,005.

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St. Albans.—12 flats at Tassell Hall estate, Lybury-la., Redbourn, for R.D.C. C. H. Huskinson, S., 43, Upper Lattimore-rd., St. Albans. Quantities by H. M. Doughty & Partners, 56, Pall Mall, London, W.C.1:—

H. E. Webster, Ltd., Harpenden, Herts	£14,750
H. D. Carter, Ltd., N.19	14,281
R. Howes, Dunstable	13,412
*A Mills, "The Bungalow," Cavan-rd., Redbourn	13,324

(Subject to M.H. approval.)

Seaton Burn.—Power station: *J. White (Shopfitters), Ltd., Team Valley Trading Estate, Gateshead.

Stretford.—16 houses at Moss Park site, for T.C. A. N. Perry, A.M.Inst.C.E., B.S.: †E. Jackson & Sons, Ltd., 33, Church-st., Stretford, Manchester.

Sunderland.—Erection of new Hill View School, for E.C. Architects: Matkin & Hawkins, Barclays Bank-chbrs., Fawcett-st., Sunderland: *Myton, Ltd., Hull, £66,500 (subject to M.E. approval).

Teignmouth.—22 houses at Coombe Valley estate, for U.D.C. W. M. Scott, S., Bitton Park: *Hill & Symons, Teignmouth, £30,012.

Turton.—26 houses with appurtenant works at Toppings estate, Eagley, for U.D.C. Sidney Kershaw, architect: *Drapers, Ltd., Bolton, £33,712.

Uttoxeter.—22 houses and incidental works at Bentley House estate, for U.D.C. S. S. Proud M.I.Mun.E., A.R.I.C.S., Cert. R.S.I., E. & S. Quantities by S. Sutcliffe, F.R.I.C.S., F.V.I., A.I.O.B.:

G. Percy Trentham, Ltd., Stoke-on-Trent	£31,896
E. G. Lester, Ltd., Stafford	30,706
Tideswell Bros., Ltd., Stoke-on-Trent	30,134
*O'Dair Bros., Ltd., Uttoxeter-rd., Tean, Stoke-on-Trent	28,305

Warrington.—Concrete covered service reservoir at High Warren, Appleton. Binnie, Deacon & Gourley, Consulting Engineers, Artillery-row, Westminster, London, S.W.1: *Holland & Hannen and Cubitts, Ltd., Queen Anne's Gate, London, S.W.1, £62,200.

Warrington.—Two houses at Battersby-la: *Tomlinson & Norbury, Orford, Warrington.

Washington.—Extensions at works of Washington Chemical Co.: *Gordon Durham & Co., Beldon-rd., East Boldon, Durham.

West Hartlepool.—46 houses at Rift House estate, for T.C. S. M. Richmond, Boro' A.: *C. M. Yuill, Ltd., Villiers-st., West Hartlepool.

Woodhead.—Erection of new tunnel, for British Railways, Eastern & Northern Regions: *Balfour, Beatty & Co., Ltd., 66, Queen-st., E.C.4, at Woodhead.

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